SYDE261 - W2011

Historical Perspectives from the Industrial Revolution
THE INDUSTRIAL REVOLUTION

Relevant Readings

Industrial Revolution at history-world.org

http://history-world.org/Industrial%20Intro.htm

Industrial Revolution at Wikipedia:

WHAT WAS IT?
The Industrial Revolution was a period from the 18th to the 19th century where major changes in agriculture, manufacturing, mining, transport, and technology had a profound effect on the socioeconomic and cultural conditions. [Wikipedia]

WHEN WAS IT?
Duh...see above...18th to 19th century.
Okay, but in some sense it is still ongoing in developing countries with the introduction of industry and manufacturing to pre-industrial societies.

WHY SHOULD YOU CARE?
You should care because you are a PRODUCT of the industrial revolution. From the clothes you wear to the food you eat and the noobs you pwn, the industrialization of our society has had a profound impact on our lives and culture.
Some definitions from the definition:

**Socioeconomic**

The behavioural interactions of individuals and groups through social capital and social "markets" and the formation of social norms. In the latter, it studies the relation of economics to social values. [Wikipedia]

**Culture**

- An integrated pattern of human knowledge, belief, and behaviour that depends upon the capacity for symbolic thought and social learning
- The set of shared attitudes, values, goals, and practices that characterizes an institution, organization or group [Wikipedia]
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So what happened?
- a turning point in human history
- average income increased 10-fold
- world population increased 6-fold
- ordinary people, the masses, gained personal wealth
- introduces new norms of luxury and personal property ownership

Economic historians are in agreement that the onset of the Industrial Revolution is the most important event in the history of humanity since the domestication of animals and plants.[13]
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How did it happen?
- the introduction of steam power (from coal)
- water wheels and powered machinery
- development of metalworking and machinery

WHO WOULD HAVE DEVISIED AND CREATED THESE INNOVATIONS?

...that’s right...ENGINEERS
How did it happen?

The commencement of the Industrial Revolution is closely linked to a small number of innovations,[14] made in the second half of the 18th century:

- **Textiles** – Cotton spinning using Richard Arkwright's water frame, James Hargreaves's Spinning Jenny, and Samuel Crompton's Spinning Mule (a combination of the Spinning Jenny and the Water Frame). This was patented in 1769 and so came out of patent in 1783. The end of the patent was rapidly followed by the erection of many cotton mills. Similar technology was subsequently applied to spinning worsted yarn for various textiles and flax for linen.

- **Steam power** – The improved steam engine invented by James Watt and patented in 1775 was initially mainly used for pumping out mines, but from the 1780s was applied to power machines. This enabled rapid development of efficient semi-automated factories on a previously unimaginable scale in places where waterpower was not available.

- **Iron making** – In the Iron industry, coke was finally applied to all stages of iron smelting, replacing charcoal. This had been achieved much earlier for lead and copper as well as for producing pig iron in a blast furnace, but the second stage in the production of bar iron depended on the use of potting and stamping (for which a patent expired in 1786) or puddling (patented by Henry Cort in 1783 and 1784).
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TEXTILES
- pre-industrial textiles based on wool
- small artisans making products by hand
- cottage industry
- IR introduced machinery and methods to cheaply and quickly produce textiles
- spinning machines
- weaving machines
- eventually steam powered the cotton mill machinery
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STEAM POWER

- used coal to burn steam and then turn machinery
- most industries still relied on wind and water
- the development was an iterative process
- better metal working meant better engines
- better metal working meant better engines
- Newcomen’s engine had 5-10 hp

USED STORED ENERGY (COAL) and put it to USEFUL WORK

Newcomen’s Steam Engine
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METALLURGY

- new equipment and energy sources (fossil fuels) means more ability to produce metal parts
- better metal parts meant better machines to make even better metal parts (ITERATIVE)
- these new techniques and products also helped build the railways!
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THERE WAS ALSO A HUGE IMPACT ON TRANSPORTATION

- industrialisation relies on trade
- roads
- railways
- canals
- these new means of transportation could also be used for non-industrial (social) purposes
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What were the social effects?

- Factories and Urbanization
- Child Labour
- Housing
- Organization of Labour
- Luddites
- Standards of Living
- Population Increase
Factories and Urbanization
- industrialisation led to the factory
- concentration of equipment and workers
- introduced new efficiency to industrial processes
- the concentration of workers also led to urbanisation, the move from rural living to urban living
- the working class now lived in cities and bought their food and supplies with their wages
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Child Labour

- children were expected to work
- could be payed less than an adult
- since the industrial machine was new children were as experienced as adults and learnt quickly
- operating a machine requires little strength so children were favoured
- beatings were common
- orphans sold as labourers to pay their board

In 1833 and 1844, the first general laws against child labour, the Factory Acts, were passed in England: Children younger than nine were not allowed to work, children were not permitted to work at night, and the work day of youth under the age of 18 was limited to twelve hours

[Wikipedia]
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Housing
- the new working class now needed somewhere to live
- wages were low and housing was poor
- toilets were shared and sewers were open in the streets
- cramped conditions and open toilets led to the spread of disease among the poor
- conditions improve over time, but a large disparity exists between poor and rich
- poor conditions led to social unrest
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Organization of Labour
- concentrated workforce - poorly payed and poor working conditions
- workers created unions to give themselves power
- would withdraw their members’ services (i.e. STRIKE)
- factory owners could give in to union demands or lose production
- unions have a socialist trend, people looking after each other
Luddites

- with increasing mechanization craftsmen and artisans lost importance

- first seen in the textile trade - lace and hosiery

- craftsmen were put out of jobs and turned their anger against the factories and machines that put them out of work

- burnt equipment and smashed factories

- led to unions

STAY TUNED FOR MORE NEXT WEEK
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Standards of Living
- malnutrition and poor medical care led to short life spans
- some historians consider the IR to have lowered the standard of living, while others disagree
- raises the question of “What is a good life?” - more on that later

Population Increase
- improved wealth and healthcare led to population increases
- Britain went from 8 million to 30 million in 100 years!
The Walloons

- Wallonia: first fully industrialized area in continental Europe
- strong socialist party and trade-unions

- 2nd industrial power in the world in the 19th Century!
- the IR then started to spread to the rest of Europe, North America, and Asia
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Political/Artistic Responses to the Industrial Revolution

Capitalism

*Main article: Capitalism*

The advent of the *Age of Enlightenment* provided an intellectual framework which welcomed the practical application of the growing body of scientific knowledge—a factor evidenced in the systematic development of the steam engine, guided by scientific analysis, and the development of the political and sociological analyses, culminating in *Adam Smith's The Wealth of Nations*. One of the main arguments for capitalism, presented for example in the book *The Improving State of the World*, is that industrialisation increases wealth for all, as evidenced by raised life expectancy, reduced working hours, and no work for children and the elderly.

Socialism

*Main article: Socialism*

Socialism emerged as a critique of capitalism. Marxism began essentially as a reaction to the Industrial Revolution.[61] According to Karl Marx, industrialisation polarised society into the *bourgeoisie* (those who own the *means of production*, the factories and the land) and the much larger *proletariat* (the working class who actually perform the *labour* necessary to extract something valuable from the means of production). He saw the industrialisation process as the logical *dialectical* progression of feudal economic modes, necessary for the full development of capitalism, which he saw as in itself a necessary precursor to the development of *socialism* and eventually *communism*.

Romanticism

*Main article: Romanticism*

During the Industrial Revolution an intellectual and artistic hostility towards the new industrialisation developed. This was known as the Romantic movement. Its major exponents in English included the artist and poet *William Blake* and poets *William Wordsworth*, *Samuel Taylor Coleridge*, *John Keats*, *Lord Byron* and *Percy Bysshe Shelley*. The movement stressed the importance of "nature" in art and language, in contrast to "monstrous" machines and factories; the "Dark satanic mills" of Blake's poem "And did those feet in ancient time". *Mary Shelley's* novel *Frankenstein* reflected concerns that scientific progress might be two-edged.