The Industrial Revolution -- Effects

London’s Rapid Growth

London was the first city to boast a population of 1 million, and it didn’t stop there. Look at the graph below to see the growth of London’s population from 1800 to 1914.
Social Changes

Journey Times from London (in hours)

<table>
<thead>
<tr>
<th>City</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edinburgh</td>
<td>4.3</td>
</tr>
<tr>
<td>Liverpool</td>
<td>2.4</td>
</tr>
<tr>
<td>Exeter</td>
<td>1.8</td>
</tr>
<tr>
<td>Birmingham</td>
<td>1.1</td>
</tr>
<tr>
<td>Brighton</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Percent increase in county population, 1771-1851:
- More than 200%
- From 100 to 199%
- From 50 to 99%
- Less than 40%

City populations, 1851:
- More than 400,000
- 300,000-400,000
- Less than 300,000

Negative Effects of The Industrial Revolution
Negative Living Conditions

- No building, or sanitary codes
- Inadequate housing, education, & police protection
- Unpaved streets; no drains
- Houses - Dark & dirty; one bedroom for a whole family
- Widespread sickness
- Loss of family stability

Factory Town
The river Irwell in Manchester flowing under Regent Road. The scum on the water is the consequence of the rivers being used as sewers.

New York Tenement
Tenements
England’s Manchester of 1835—the hub of Britain’s cotton industry—was described by French journalist Alexis de Tocqueville as a city of half-daylight smothered by black smoke. He went on to say, "Heaps of dung, building rubble . . . one-story houses whose ill-fitting planks and broken windows suggest a last refuge between poverty and death . . . yet below some a row of cellars, 12 to 15 human beings crowded into each repulsive hole . . . [Yet] from this foul drain, the greatest stream of human industry flows out to fertilize the whole world, from this filthy sewer pure gold flows."
Negative Factory Conditions

- Average life span 17 years
- Average work day 14 hrs; 6 days a week
- Factories not well lit or clean
- Machines injured workers; no workman's comp.
- Middle class forms
- Child labor in factories & mines
Industrial Plant
A report published in July 1833 stated that most factories were "dirty; low-roofed; ill-ventilated; ill-drained; no conveniences for washing or dressing; no contrivance for carrying off dust and other effluvia (discharge or liquid waste)".
"My joints were like so many rusty hinges, that had laid for years. I had to get up an hour earlier, and, with the broom under one arm as a crutch, and a stick on my hand, walk over the house I had got my joints in working order." — William Dodd
“The little ones, they have to climb up to reach the bobbins. If they slip they can hurt themselves badly”

“Work in a spinning room from 7 o’clock in the morning until 6 o’clock at night is the wrong kind. It keeps the children out of school, it gives them no chance to play, and they cannot grow strong.”
“Sometimes the boys wear lamps in their caps to help them see through the thick dust. They bend over the chutes until their backs ache, and they get tired and sick because they have to breathe coal dust instead of good, pure air.”

Child Labor Bulletin
“A child was working wool, that is, to prepare the wool for the machine; but the strap caught him, as he was hardly awake, and it carried him into the machinery; and we found one limb in one place, one in another, and he was cut to bits; his whole body went in, and was mangled.” John Allett

“It was so dusty, the dust got up my lungs, and the work was so hard. I got so bad in health, that when I pulled the baskets down, I pulled my bones out of their places.” Elizabeth Bentley was born in Leeds 1809. She began working in a flax mill at the age of six.
Cripples in the yard of children’s home in London.

Stereotype of the Factory Owner
“Upstairs”/“Downstairs” Life

Positive Effects of Industrialization

- Created jobs
- Contributed to England’s wealth
- Fostered technological progress
- Increased production of goods & raised the standard of living
- Provided hope for improving people’s lives
- Advances in transportation, agriculture, & communication
- Growth in worldwide trade
- Child labor laws end abuses
- Reformers urge equal distribution of wealth
Flywheel assembly line at the Ford Motor Company's Highland Park, Michigan plant in 1913. The use of a moving line reduced a car's assembly time from 12 hours to 93 minutes. The world's first automatic conveyor belt not only revolutionized the Industrial Age.
## Labor Abuses: Why Reform?

- Unsafe Working Conditions
- Child Labor
- Unequal Wealth Distribution
- Workers Overworked and Underpaid

## REFORMS?

- Labor Unions
- Labor Laws
  - Factory Act of 1833
  - 10 Hours Act of 1847

### Table: Factory Legislation 1802–1878

<table>
<thead>
<tr>
<th>Year</th>
<th>Act or Investigation</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1802</td>
<td>Health and Morals of Apprentices Act</td>
<td>Hours of work were limited to 12 per day, with no night work allowed. Employers were to provide education, decent clothing and accommodation. Inspectors were to enforce the Act and appoint visitors. For all textile factories employing over 20 persons, proper ventilation was to be provided and mills were to be whitewashed twice a year.</td>
</tr>
<tr>
<td>1833</td>
<td>Factory Act</td>
<td>No children under 9 were to work in factories (silk mills exempted). Children under 13 years were to work no more than 9 hours per day and 48 hours per week. Children under 18 were not to work nights. 4 paid Inspectors were appointed. Two 8-hour shifts per day of children were to be allowed.</td>
</tr>
<tr>
<td>1844</td>
<td>Factory Act</td>
<td>Women and young persons (13-18) were to work no more than 12 hours per day. Children under 13 were to work no more than 6 1/2 hours per day. No child under 8 was to be employed.</td>
</tr>
<tr>
<td>1847</td>
<td>Factory Act</td>
<td>Women and young persons were to work no more than 10 hours per day.</td>
</tr>
<tr>
<td>1850</td>
<td>Factory Act</td>
<td>Women and young persons to work in factories only between the hours of 6 a.m. and 6 p.m. or 7 a.m. and 7 p.m.</td>
</tr>
<tr>
<td>1853</td>
<td>Factory Act</td>
<td>Children were only to work during the same hours as women and young persons.</td>
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<tr>
<td>1860</td>
<td>Bleach and Dye Works Act</td>
<td>This extended existing provisions to bleach and dye works.</td>
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<tr>
<td>1864</td>
<td>Factory Acts Extension Act</td>
<td>Extended the previous acts to cover more industry types.</td>
</tr>
<tr>
<td>1878</td>
<td>Factory Act</td>
<td>Extended the Factory Acts to all industries. No child anywhere under the age of 10 was to be employed. 10-14 year olds could only be employed for half days. Women were to work no more than 56 hours per week (<a href="#">Factory Legislation 1802-1878</a>).</td>
</tr>
</tbody>
</table>
A filthy "Father Thames"

EFFECTS OF INDUSTRIAL REVOLUTION
CONSEQUENCES OF THE INDUSTRIAL REVOLUTION

- Creation of an Industrial Working Class
  - Rise of organized labor
- Urbanization – industry as “city forming” activity
- Population Effects: Malthus’ warning vs. productivity increases, health improvements, lowered birth rates
- Growth of Global Markets & International Trade – transport improvement, international finance, timing of development

In 1837 the first electrical telegraph instruments were invented by Samuel Morse in the United States and by Sir Charles Wheatstone and Sir William F. Cooke in Britain. Morse sent the first public telegraph message in 1844. Pictured here is the original Morse receiving device.
THOMAS EDISON

an American inventor and businessman who developed many devices

The light bulb “lit up the world”

New Ways of Thinking
Thomas Malthus

- Population growth will outpace the food supply.
- War, disease, or famine could control population.
- The poor should have less children.
- Food supply will then keep up with population.

The Luddites: 1811-1816

Attacks on the “frames” [power looms].
Ned Ludd [a mythical figure supposed to live in Sherwood Forest]
David Ricardo

- “Iron Law of Wages.”
- When wages are high, workers have more children.
- More children create a large labor surplus that depresses wages.

The Utilitarians:

Jeremy Bentham & John Stuart Mill

- The goal of society is the greatest good for the greatest number.
- There is a role to play for government intervention to provide some social safety net.
Jeremy Bentham

The Socialists:
Utopians & Marxists

- People as a society would operate and own the means of production, not individuals.
- Their goal was a society that benefited everyone, not just a rich, well-connected few.
- Tried to build perfect communities [utopias].
The Results of Industrialization at the end of the 19c

The Politics of Industrialization

- State ownership of some industries.
  - RR s → Belgium & most of Germany.
- Tariffs → British Corn Laws.
- National Banks granted a monopoly on issuing bank notes.
  - Bank of France.
- Companies required to register with the government & publish annual budgets.
- New legislation to:
  - Establish limited liability.
  - Create rules for the formation of corporations.
- Postal system.
- Free trade zones → Ger. Zollverein
By 1850:
Zones of Industrialization on the European Continent

- Northeast France.
- Belgium.
- The Netherlands.
- Western German states.
- Northern Italy
- East Germany → Saxony
Railroads on the Continent

Share in World Manufacturing Output: 1750-1900