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## I. The Industrial Revolution/Industrialization

### A. Roots of the Industrial Revolution

#### 1. The Commercial Revolution

- ⇒ European rulers encourage trade
- ⇒ Rise of Entrepreneurs and capitalism
- ⇒ New industries form: cloth, mining printing, shipbuilding, cannons and muskets
- ⇒ Enclosure Movement: fenced properties allow farmers to experiment

#### 2. The Scientific Revolution

- ⇒ Produced the first wave of technological advances and inventions
- ⇒ The advancements in medical/agricultural science—led to massive population rate

#### 3. Proto-Industrialization (aka: “The Cottage Industry”)

- ⇒ Merchants provide peasants with raw materials, peasants produce, sold back to merchants
- ⇒ Led to major economic growth

#### 4. The Agricultural Revolution

- ⇒ Crop-rotation: convertible husbandry (dealt with lost nutrients in soil)
- ⇒ more efficient farming → farmers moving to cities → factory labor surplus

### B. Conditions Favorable to the Industrial Revolution in England

#### 1. Geography

- ⇒ natural isolation prevented continental wars so they could focus more on revolutions
- ⇒ Many waterways (powered factories and assisted in transportation)

#### 2. High Capital and Successful Colonies

- ⇒ Wealth was accumulated from many successful colonies (raw materials)
- ⇒ The bank of England was established in 1694, allowing entrepreneurs to take out loans

#### 3. Supportive Government

- ⇒ Bubble Act was repealed (joint-stock companies legal again)
- ⇒ Navigation Acts were repealed (promoted free trade)
- ⇒ emphasized navy, keeping England safe from foreign invasion and trade routes

### C. Important Inventions

1. Kaye’s Flying Shuttle: Allowed weaving to be done by a singular person

2. Hargreaves’ Spinning Jenny: Allowed thread to be spun faster.

3. Arkwright’s Water Frame: Produced strong thread that could be re-spun by spinning jenny

4. Crompton’s Spinning Mule: Advanced the processes of water frame and spinning jenny

### 5. James Watt's Steam Engine: Most Important IR invention.

- ⇒ Used pressure and steam to create power to generate machines
- ⇒ Factories did not have to be built near waterways anymore.
- ⇒ triggered Transportation Revolution

## D. Transportation Revolution

### 1. Water

- ⇒ Canal systems or waterways allowed ships to go against a current
- ⇒ Robert Fulton's Steamboat: allowed two way travel on rivers and faster travel

### 2. Land

- ⇒ John McAdam's Hard Surfaced Roads: Improved and sped up land travel.
- ⇒ George Stephenson's Locomotive: "The Rocket" – 1<sup>st</sup> successful train
  - Lowered shipping costs, allowed for quicker travel, encouraged suburbs

Adam Wagner

## E. Continental Europe industrializes after 1815

### 1. Industrialization spreads in Europe in three waves.

- ⇒ First Wave 1815: Begins in Belgium, Holland, and France
- ⇒ Second Wave 1850: Spreads to Germany, Austria, and Italy
- ⇒ Third Wave Late 19<sup>th</sup> Century: Spreads to all of Eastern Europe

### 2. Importance of banks

- ⇒ financing transportation, investments, loans, industrializations, etc.

### 3. Great Britain in advance from the rest of Europe

## F. Social implications of the Industrial Revolution

### 1. Urbanization

- ⇒ Massive population growth (50% increase between 1870-1914)
  - Due to improvements in medical knowledge, nutrition, and housing

### 2. Struggle between labor and capital

- ⇒ Proletariat and the rest of the working class formed unions to resist exploitations
  - Groups like Chartists and Luddites fought for workers' rights and suffrage
  - improved working conditions, brought better wages, and reduced work hours

### 3. Working conditions

- ⇒ Abandoned children worked long hours in terrible conditions (child exploitations)
- ⇒ Better wages for skilled males, separating them from wives and children

- ⇒ Women were required to have jobs and keep up the household duties
- 4. Economics: the “dismal science”
  - ⇒ Rise of Entrepreneurs: Banks allowed investing in factories
  - ⇒ Free Trade: trade within a vast colonial empire.
    - France and Spain gave Britain sources of new material
  - ⇒ Bubble Act: Allowed creation of joint stock companies
  - ⇒ Lowes Act: Allowed for business owners to be only partly liable for their business
- 5. Liberal reforms to address the plight of industrial workers
  - ⇒ Combination Acts (1799)
    - Illegalized Labor Unions
    - Disregarded by the workers, repealed in 1824
- 6. Eventual rise in the standard of living
  - ⇒ During the IR, standard of living decreased.
  - ⇒ Toward the end of the IR, the overall standard of living increased

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## II. Urbanization and Life in the Late Nineteenth Century

### A. Living conditions

#### 1. Everyday life associated with...

- ⇒ Steel: used for – steel rails, larger structures, heavy machinery
  - Bessemer Process: better quality steel, manufacturing cheaply in large quantities
- ⇒ Oil: used for – internal combustion engine for factory machines
  - Automobile invented by German engineer Gottlieb Daimler
- ⇒ Electricity
  - Most versatile and transportable source of power
    - a. Easy delivery, flexible factory locations, efficient factory construction
  - 1881- first major public power plant constructed in England
  - Powered cities – electric poles, lines, generating stations, lights at home
- ⇒ Chemicals
  - Solway process of alkali production, sulfuric acid, laundry soap, dyestuffs, plastics, pharmaceuticals, explosive, fertilizers, photo processing
  - Germany in the lead

#### 2. Expansion of industry and technology

⇒ Growing demand for experts with specialized knowledge

⇒ Massive population growth especially in cities

### 3. Economy

⇒ Difficulties: last quarter of 19<sup>th</sup> century, slower economic development

- decline in agriculture due to bad weather and foreign competition
- bank failures and decline of capital investment
- high unemployment rate
- fed the growth of trade unions and socialist political parties

⇒ General standard of living

- prices, wages, profits held firm (even increased in some countries)

## B. Improvements in health

### 1. Louis Pasteur

⇒ formulated by Germ theory (microbes caused disease) → importance of vaccination

### 2. Jeremy Bentham

⇒ Utilitarianism: pursue the “greatest good for the greatest number”

### 3. Edwin Chadwick (influenced by Jeremy Bentham)

⇒ “Sanitary idea”: disease could be prevented with sanitary urban environment

⇒ Britain passed the 1<sup>st</sup> public health law in 1848

### 4. Expanded government involvement in public health

## C. Urban planning and public transportation

### 1. Georges von Haussmann: redevelopment of Paris

⇒ Wide boulevards, better middle-class housing, demolished slums, open spaces

⇒ Other cities followed the lead of Paris

### 2. Expanded government involvement in public health

### 3. Mass transportation – city transportation with electric streetcar

⇒ prevented urban overcrowding, encouraged suburbs

## D. Social structure: classes and the changing family

### 1. Middle class grew increasingly diverse

⇒ Wealthy → entrepreneurs, professionals → petite bourgeoisie

⇒ House reforms for middle class

- pre-1848, large families in a room, a single toilet facility for a whole tenements
- after revolutions of 1848, housing solve medical, moral, and political dangers