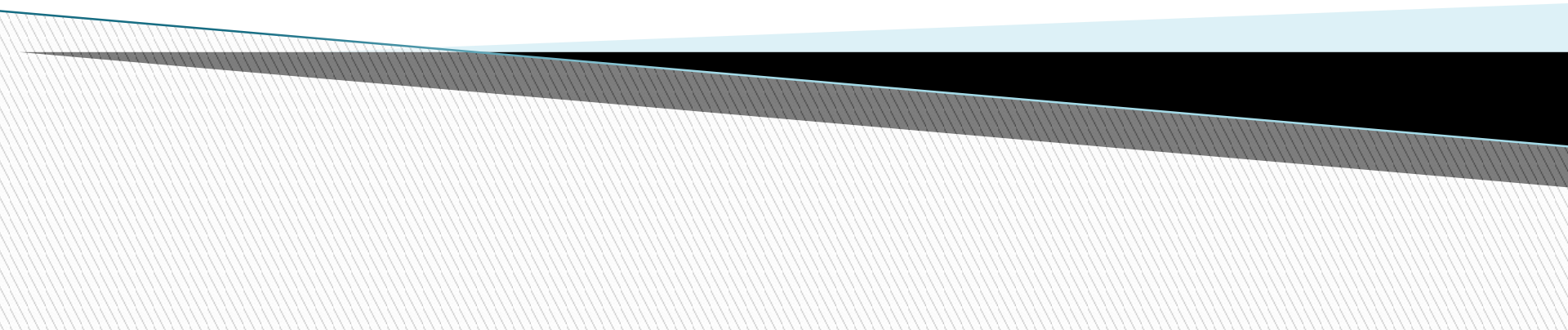


The Industrial Revolution Begins

1750–1850



Chapter Outline



Chapter Three

Section One: Dawn of the Industrial Age

Section Two: Britain Leads the Way

Section Three: Hardships of Early Industrial Life

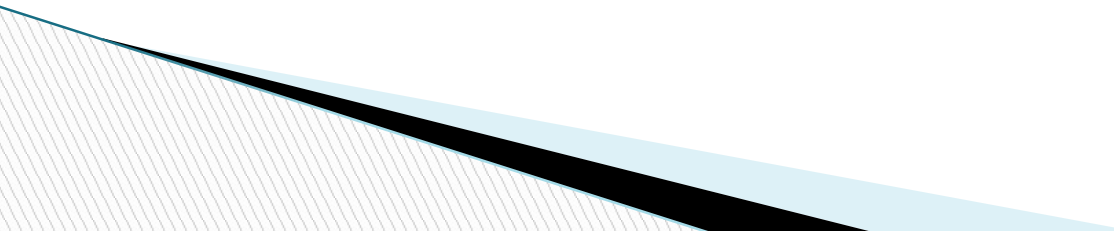
Section Four: New Ways of Thinking



Dawn of the Industrial Age

- ▶ For Thousands of years people had lived and worked in small farming communities, the Industrial Revolution changed that forever

Make Sure You Can Answer...

- ▶ What factors contributed to a second agricultural revolution?
 - ▶ Why did populations soar in Europe?
 - ▶ What energy sources powered the Industrial Revolution?
- 

Make Sure You Can Define...

- ▶ Charles Townshend
 - ▶ Jethro Tull
 - ▶ Robert Bakewell
 - ▶ Thomas Newcomen
 - ▶ James Watt
 - ▶ enclosure
- 

A Turning Point in History

- ▶ Up until 1750, most people in the world knew only of their own village
- ▶ They...
 - Lived in simple cottages lit by fire and candles
 - Made their own clothes
 - Grew their own food
 - Rarely left their hometown
- ▶ By 1850....
 - Small villages had grown into big cities
 - People bought food and clothes in stores
 - Communicated through telegraph
 - Traveled great distances

How did this...

Turn into this?

Agricultural Revolution

- ▶ In the early 1600s farming improved....
- ▶ Different types of soil was used to improve crop yield
- ▶ Smaller fields were combined into larger ones



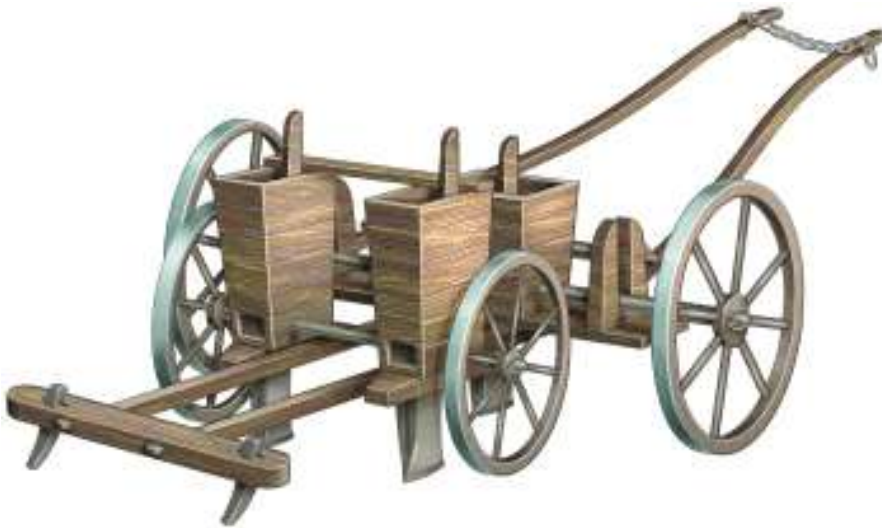
Agricultural Revolution

- ▶ Charles Townshend
- ▶ Urged farmers to grow turnips, which would replenish the nutrients in the soil.



Agricultural Revolution

- ▶ Jethro Tull
- ▶ Invented the Seed Drill, deposited seeds in rows instead of scattering them.



Agricultural Revolution

- ▶ Robert Bakewell
- ▶ Bred stronger horses and fatter cattle



Agricultural Revolution

▶ Enclosure movement

- Rich landowners took over and fenced off land that had been worked by peasants.
- The land could now be worked more efficiently, as farm output rose
- Many people lost their jobs and were forced to move to the cities to find work in the growing industry there.

Population Explosion

- ▶ Britain's population almost doubled from 1700 to 1800
- ▶ France's population increased by 9 million people
- ▶ Europe's population grew by 70 million!
 - ▶ WHY??????
- ▶ Better and more plentiful food
- ▶ Diseases like bubonic plague were gone
- ▶ Better hygiene and sanitation
- ▶ Improved medical care



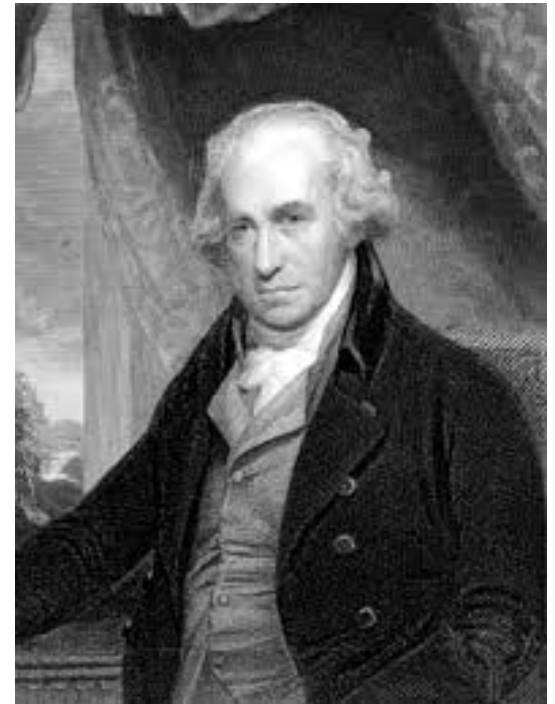
An Energy Revolution

- ▶ Giant water wheels powered factories
- ▶ People then discovered new sources of energy....



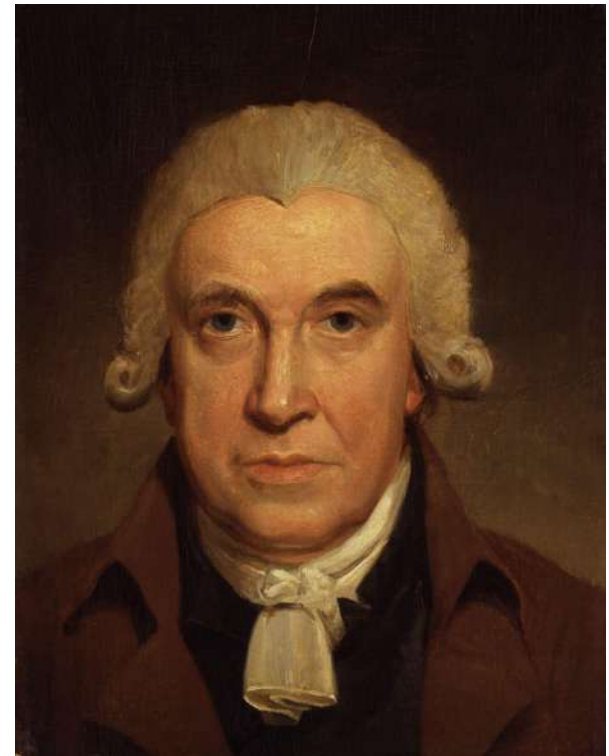
An Energy Revolution

- ▶ Thomas Newcomen
- ▶ Developed a steam engine powered by coal that could run factories in 1712.

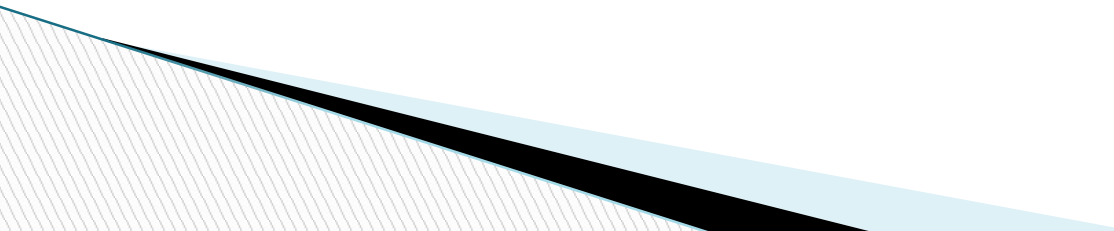


An Energy Revolution

- ▶ James Watt
- ▶ Developed an improved steam engine in 1769



Make Sure You Can Answer...

- ▶ What factors contributed to a second agricultural revolution?
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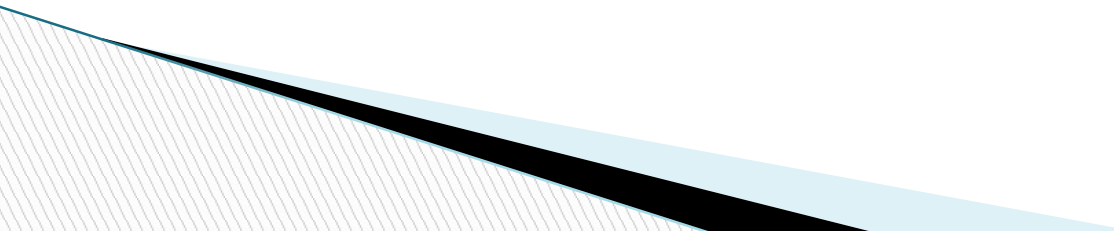
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 - ▶ James Watt
 - ▶ enclosure
- 

Britain Leads the Way

- ▶ “...lo the giant aisles Rich in Model and design;
 - ▶ Harvest tool and husbandry,
 - ▶ Loom and wheel and enginery,
 - ▶ Secrets of the Sullen mine
 - ▶ Steel and Gold, and coal and wine
 - ▶ Fabric rough or fairy fine...
 - ▶ And shapes and hues of art divine!
 - ▶ All of beauty, all of use
 - ▶ That one fair planet can produce”

Make Sure You Can Answer...

- ▶ Why was Britain the first nation to industrialize?
 - ▶ Why were coal and iron important to the industrial age?
 - ▶ How did industrialization change the textile industry?
- 

Make Sure You Can Define...

- ▶ Abraham Darby
 - ▶ John Kay
 - ▶ James Hargreaves
 - ▶ Richard Arkwright
 - ▶ Robert Fulton
 - ▶ Factory
 - ▶ turnpike
- 

Why Britain?



- ▶ Resources: Britain had an abundance of.....
 - Natural Resources
 - Human Resources
 - New Technology

- ▶ Britain had favorable social, political, and economic conditions



Why Britian?

▶ Natural resources

- Britain had a large amount of two important natural resources
 - 1. Coal: The fuel that powered the steam engines
 - 2. Iron: The material that built the new machines



Why Britain?

▶ Human Resources

- The agricultural revolution (section one) led to a large number of people needing work.
- The population boom increased the workforce even more.



Why Britain?

▶ New Technology

- Britain had been at the center of the scientific revolution and the Enlightenment
- Britain had lots of skilled mechanics eager to produce practical inventions



Mechanic

Why Britain?

▶ Economic Conditions

◦ Capital

- Due to its large overseas empire, the business class had a great deal of wealth to invest

◦ Demand

- The population explosion led to a greater demand for goods, as did general economic prosperity.

Why Britain?

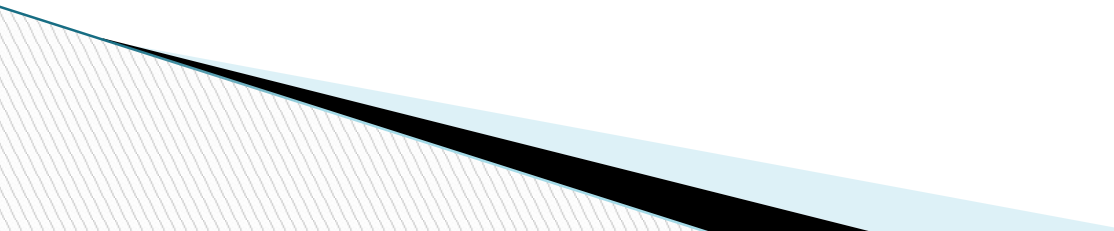
▶ Political Conditions

- Britain had a stable government, a strong navy, and an upper class that did not resent new economic growth

▶ Social Conditions

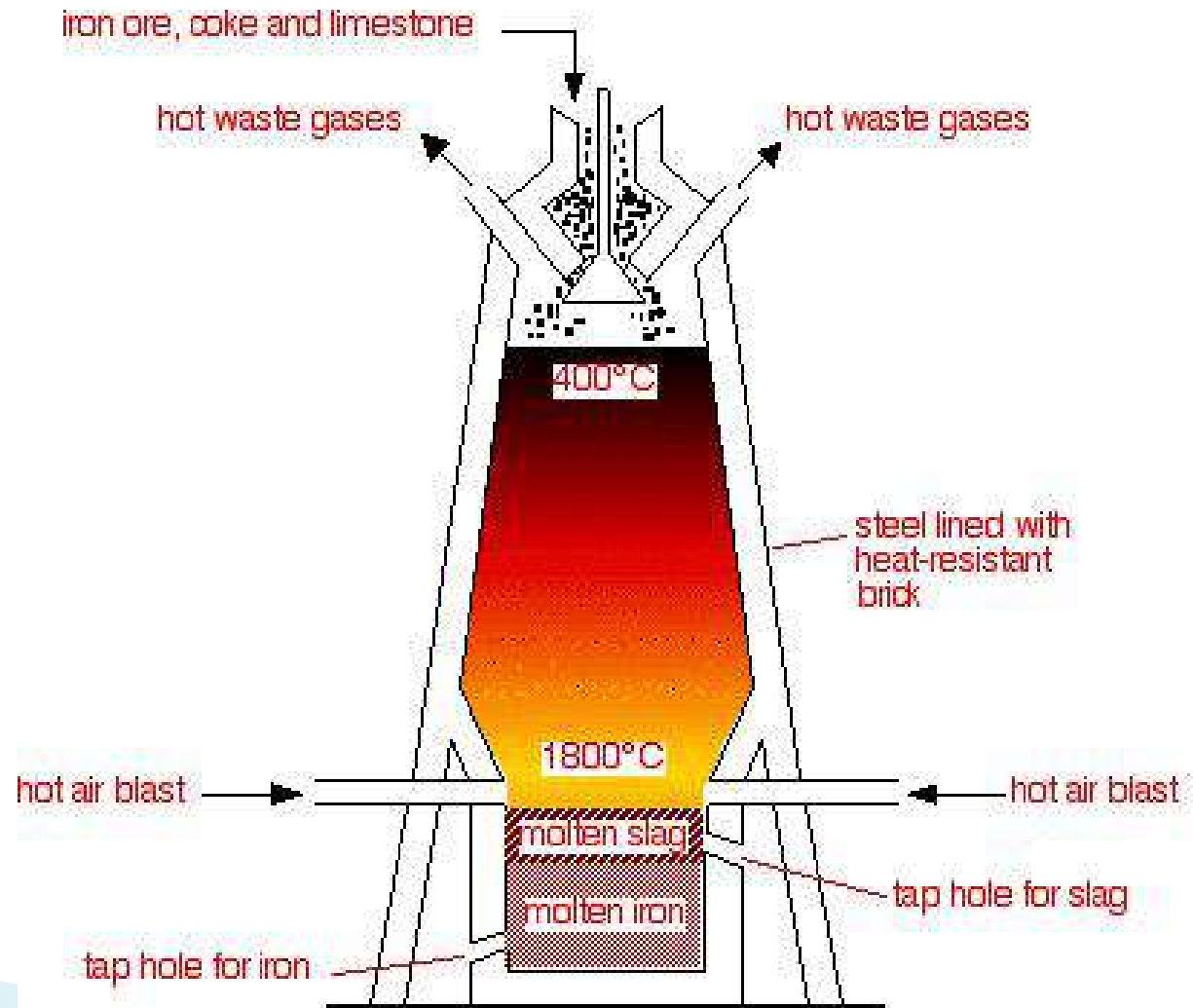
- Many entrepreneurs came from religious groups that valued thrift and hard work.
- For those to whom religion was not important, they dedicated their time improving their business.

The Age of Iron and Coal

- ▶ Iron was needed to produce steam engines and machines
 - ▶ The process of removing the iron from the rock is called smelting
- 

The Age of Iron and Coal

► Smelting



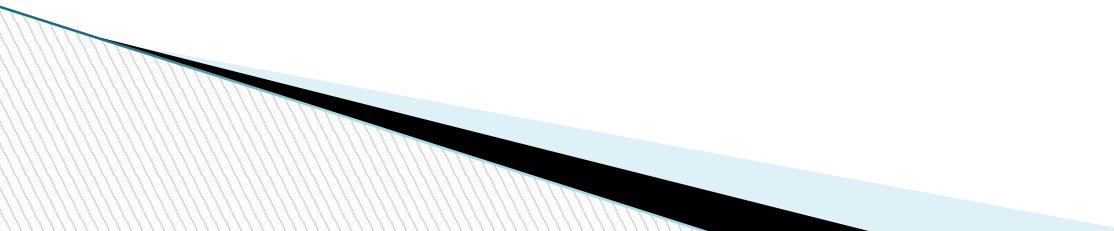
The Age of Iron and Coal

- ▶ Abraham Darby began to use coal, instead of wood, in the smelting process.
- ▶ His methods led to better quality and cheaper iron.



Revolutionary Changes in the Textile Industry

▶ The early industry

- In the early 1600s cotton cloth from India was very popular
 - Production in Britain started as raw cotton was given to peasants who spun the cotton into cloth
 - This process was slow and inefficient.
- 

Revolutionary Changes in the Textile Industry

- ▶ John Kay
- ▶ Invented the flying shuttle
- ▶ Helped speed up production
- ▶ Wove cloth very fast



Revolutionary Changes in the Textile Industry

- ▶ James Hargreaves
- ▶ Invented the spinning Jenny
- ▶ Produced cloth even faster



Revolutionary Changes in the Textile Industry

- ▶ Richard Arkwright
- ▶ Inventor of the water frame
- ▶ Made the spinning process even faster by using water power.



Revolutionary Changes in the Textile Industry

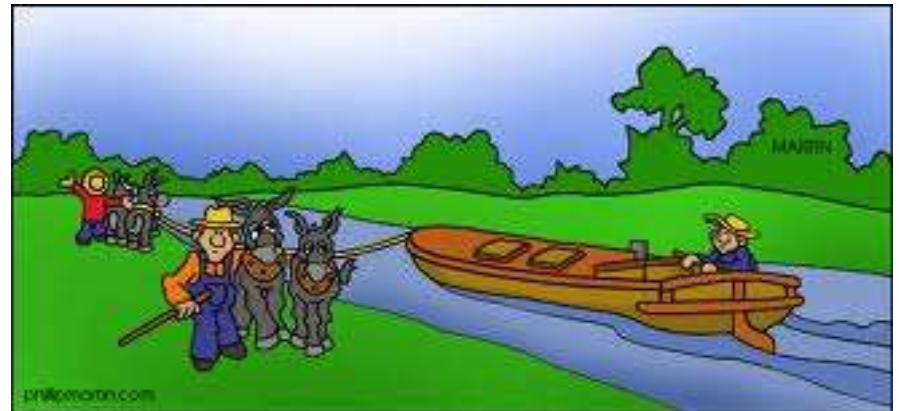
▶ The first factories

- Manufacturers needed large buildings to house the new factories
- The buildings were at first built near rapidly moving streams in order to harness the power from the water.
- Later, steam powered the machines.
- The buildings were called **factories**



Revolution in Transportation

- ▶ As goods were manufactured, people needed a quick way to get them to market
- ▶ **Turnpikes** and canals were built



Revolution in Transportation

▶ On Land

- George Stephenson developed the steam powered locomotive.



Revolution in Transportation

▶ On Sea

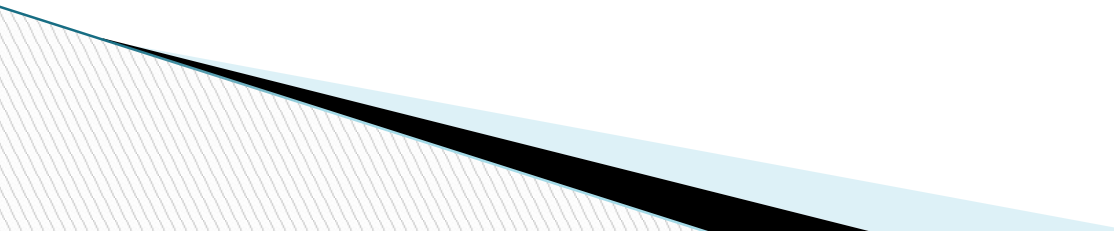
- Robert Fulton put James Watt's steam engine on a boat to create the world's first steamship
- By the late 1800s steamships could carry 10 to 20 times the amount of cargo that wooden ships could.



Looking Ahead

- ▶ The Industrial revolution triggered a chain reaction..
- ▶ The supply of goods increased...prices fell... lower prices meant more people could buy the goods...which meant more demand...

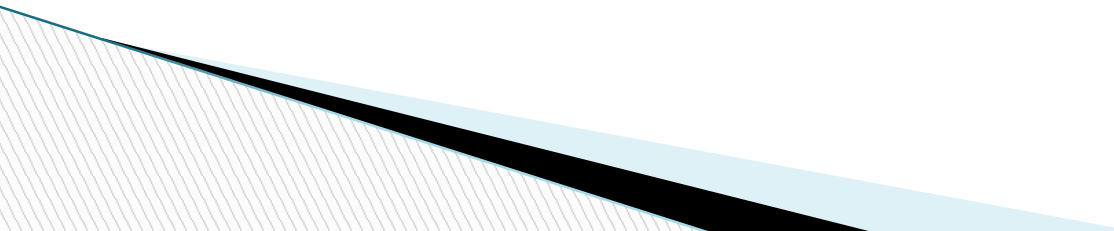
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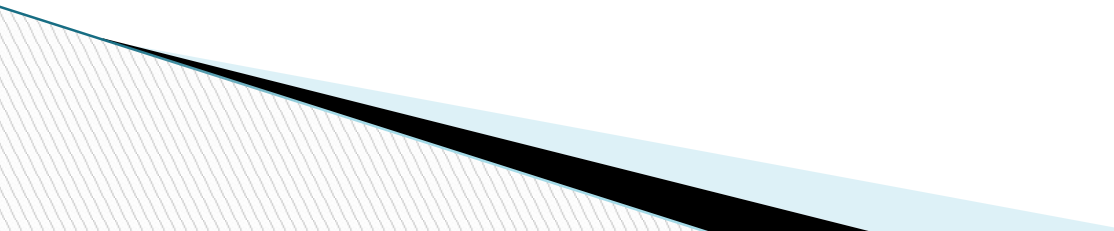
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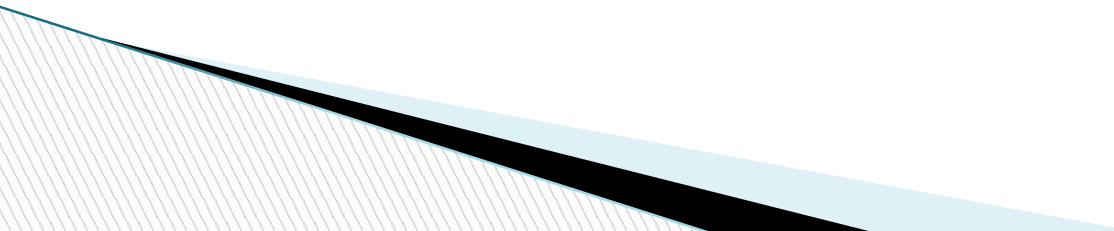
Hardships of Early Industrial Life

- ▶ “It was a town of machinery and tall chimneys, out of which interminable serpents of smoke trailed themselves forever and ever...It had a black canal in it, and a river that ran purple with ill smelling dye. It was inhabited by people who went in and out at the same hours...to do the same work, and to whom every day was the same as yesterday and tomorrow, and every year the same counterpart of the last and the next”
- 

Make Sure Can Answer...

- ▶ How did the factory system change worker's lives?
 - ▶ What problems did the industrial working class face?
 - ▶ What were the costs and benefits of the Industrial Revolution?
- 

Make Sure You Can Define...

- ▶ Luddite
 - ▶ John Wesley
 - ▶ Methodism
 - ▶ urbanization
- 

The New Industrial City

- ▶ The Industrial Revolution brought rapid **urbanization**. Why?
- ▶ Small towns grew into large cities almost overnight
- ▶ Manchester went from 17,000 people in 1750 to 70,000 in 1801
- ▶ The new industry also brought pollutants...



The New Industrial city

- ▶ In industrial cities there was a big divide between wealthy and poor.
- ▶ The wealthy lived in big houses in pleasant neighborhoods.



The New Industrial city

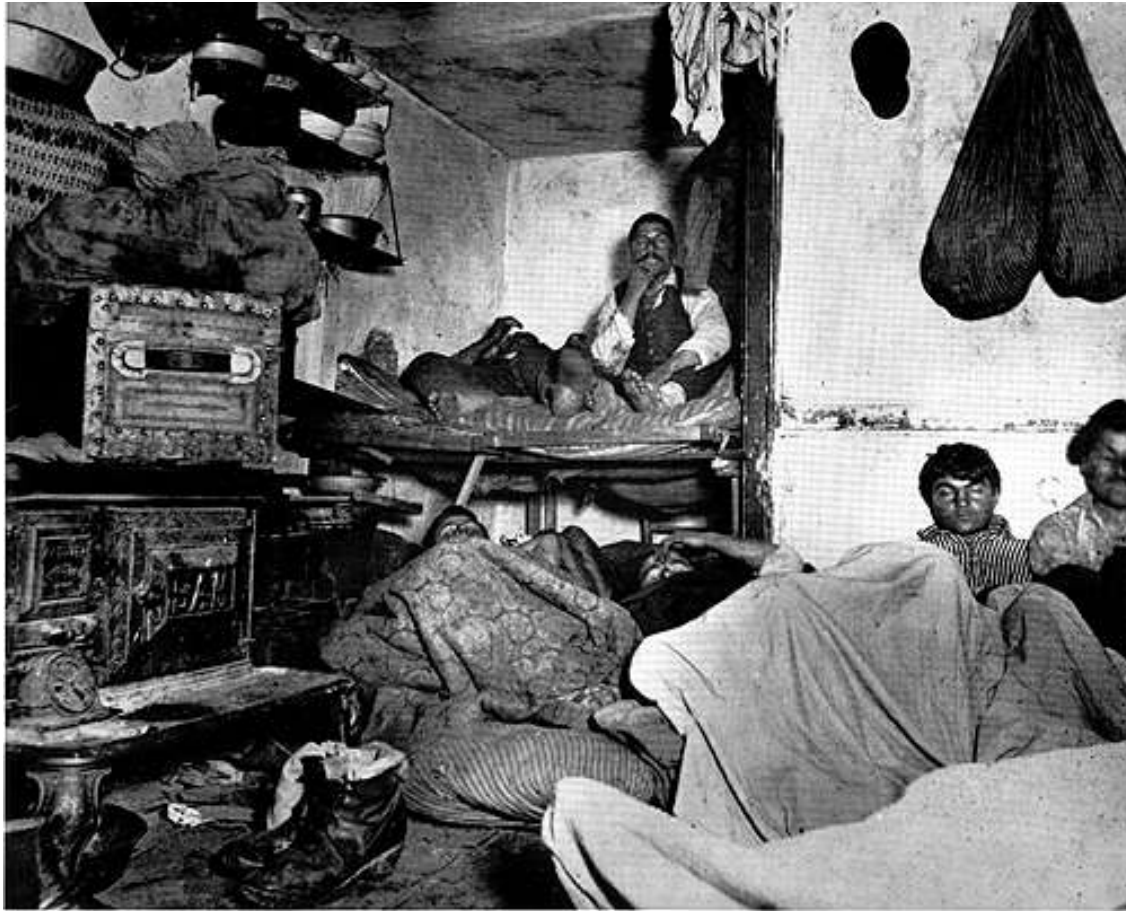
- ▶ The poor working class lived in crowded apartments in crowded neighborhoods.
 - No running water
 - Very little light
 - No sewage or sanitation
 - Streets littered with garbage and human waste
 - Disease spread rapidly

The New Industrial city





The New Industrial city



The Factory system

▶ Rigid discipline

- One shift in a factory lasted 12–16 hours
 - The school day lasts around 6 hours...and we have breaks!
- There were lots of accidents, workers lost fingers, limbs, sometimes their lives
- The air was filled with coal dust or cotton lint, which damaged workers lungs.

The Factory system

▶ Women workers

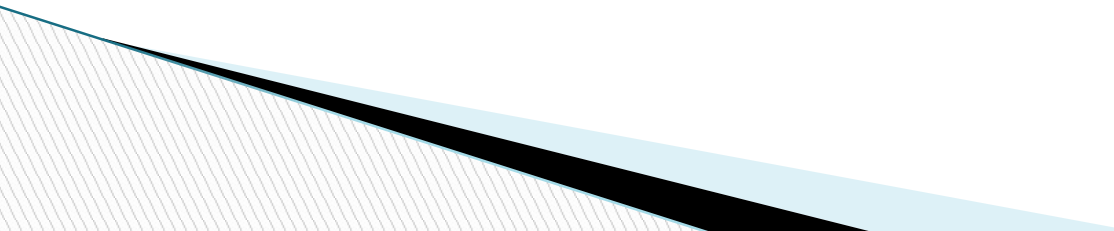
- Many of the employees in factories were women
- Factory owners preferred women as workers because they could pay them less
- Factory work presented special challenges for women, who were still expected to cook, clean and care for the family while working 12–16 hour days.

The Factory System

▶ Child Labor

- Parents accepted the idea of children in factories because they had been helping with farm work.
- Parents believed that child labor was necessary because the income was needed.
- Often children, like their parents, were treated as slaves.

Patience Kershaw

- ▶ Patience was 17 years old and a worker in the coal mines.
 - ▶ Her father had died, leaving her mom to raise 10 children, all of whom worked in industry
 - ▶ Patience had the job of pushing carts of coal to the surface of the mine
 - ▶ If she did not push the cart fast enough, she was beaten.
- 

Patience Kershaw

- ▶ “My father has been dead about a year. My mother has 10 children, 5 lads and 5 lasses. The oldest is about 30, the youngest is 4. Three lasses go to the mill. All the lads are coal miners.”
- ▶ Out of 10 children, how many worked in the mill?

Patience Kershaw

- ▶ “I go to the mine at 5 o’clock in the morning and come out at 5 in the evening...I hurry in the clothes I have now got on, trousers and ragged jacket. The bald place upon my head is made by pushing the carts. I hurry the carts a mile more underground and back. I wear a belt and chain...to get the corves out.”
- ▶ If you were in the government, what would be your biggest concern about the working conditions?

Patience Kershaw

- ▶ Because of testimony from Patience, the British government began the process of regulating child labor in mines and factories.

The Working Class

▶ Protests

- As new machines and “labor-saving” devices were invented, workers revolted. Why?
- Protestors smashed machines and burned factories
- Protestors were called **Luddites**, after mythical figure Ned Ludd

▶ Repression

- Protestors were sometimes killed
- Labor Unions and strikes were outlawed

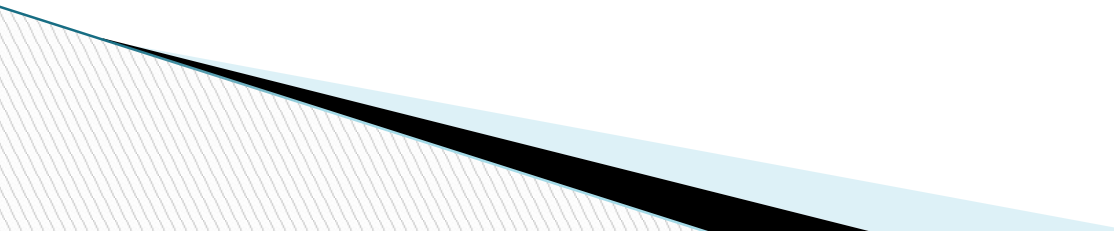


The Working Class

- ▶ Spread of Methodism
- ▶ John Wesley started the church
- ▶ Methodism stressed adopting sober, moral ways



The Working Class

- ▶ Methodist church services featured hymns and sermons promising forgiveness and a better life to come.
 - ▶ Methodist preachers went into slums and started Sunday schools
 - ▶ Methodists helped workers channel their anger into social reform.
- 

The New Middle Class

▶ Who were they?

- Merchants who invested their profits
- Inventors
- Skilled artisans

▶ How did they live?


- Solid, well furnished homes
 - Well dressed
 - Active politically
- 

The New Middle Class

▶ Women

- Encouraged to behave as “ladies
- Took up activities such as drawing or piano playing
- Did not work outside the home
- Hired a maid to do the housework

▶ Values

- The middle class valued hard work and determination
 - Were sometimes critical of the poor, thinking they were too lazy to become successful
- 

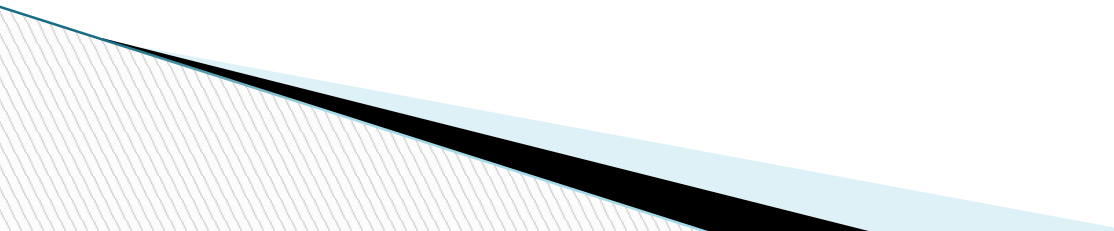
Benefits and Problems

- ▶ New goods reach more people
- ▶ More opportunity for wealth
- ▶ Increased travel brought people closer together.
- ▶ Low pay
- ▶ Dismal living conditions
- ▶ unemployment

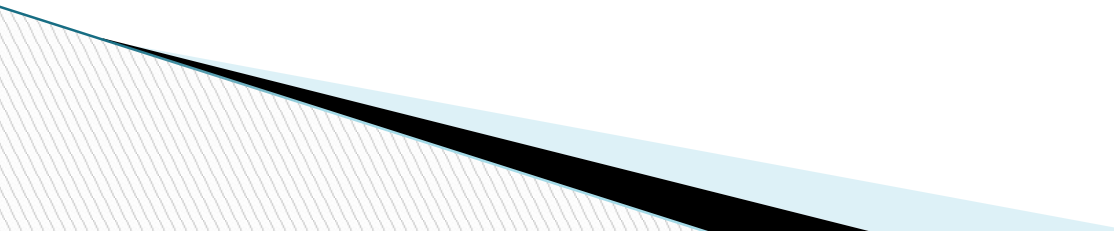
Benefits

Problems

Make Sure You Can Answer...

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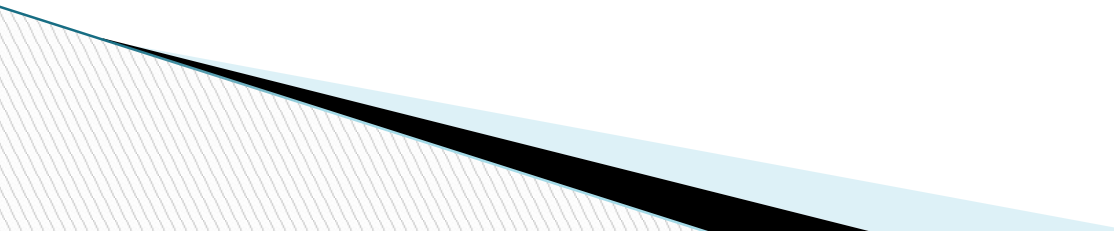
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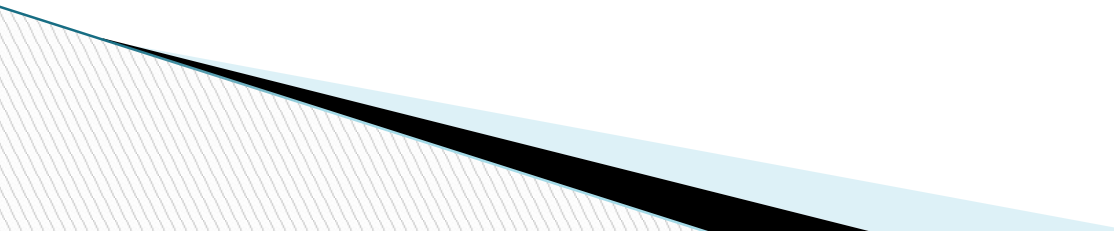
New Ways of Thinking

- ▶ “The power of population is far greater than the power of the Earth to provide subsistence for man.” -Thomas Malthus

Make Sure You Can Answer...

- ▶ What economic ideas helped shape the industrial age?
 - ▶ What reforms did individual thinkers urge?
 - ▶ How was socialism linked to the Industrial Revolution?
- 

Make Sure You Can Define...

- ▶ Thomas Malthus
 - ▶ Iron law of wages
 - ▶ John Stuart Mill
 - ▶ Utopians
 - ▶ The Communist Manifesto
 - ▶ Socialism
 - ▶ Communism
 - ▶ Proletariat
 - ▶ utilitarianism
- 

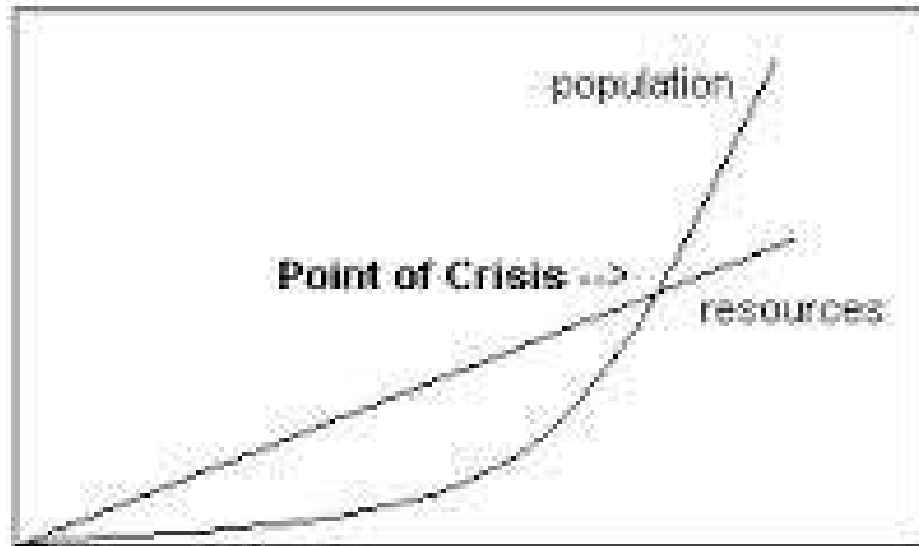
Laissez-Faire Economics

- ▶ Adam Smith
- ▶ Believed the free market would help everyone
- ▶ Goods would cost less and be more available
- ▶ The more the economy grew, the more people would reinvest



Laissez-Faire Economics

▶ Thomas Malthus



Malthus' Basic Theory

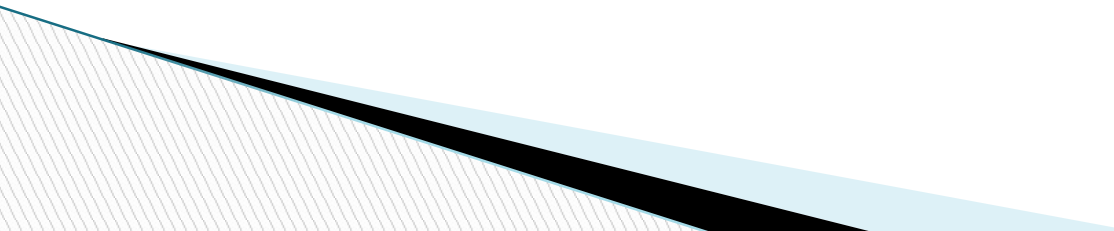


Laissez-Faire Economics

▶ Thomas Malthus' Theory

- If the population kept increasing, there would not be enough food, and the poor would suffer.
- The only checks on population were war, famine, and disease.

▶ Opposite view

- As the population grew, so too did the food supply.
 - As the century progressed, living conditions improved.
 - In the 1900s, population was not a problem in the west, but was a problem in other parts of the world.
- 

Laissez-Faire Economics

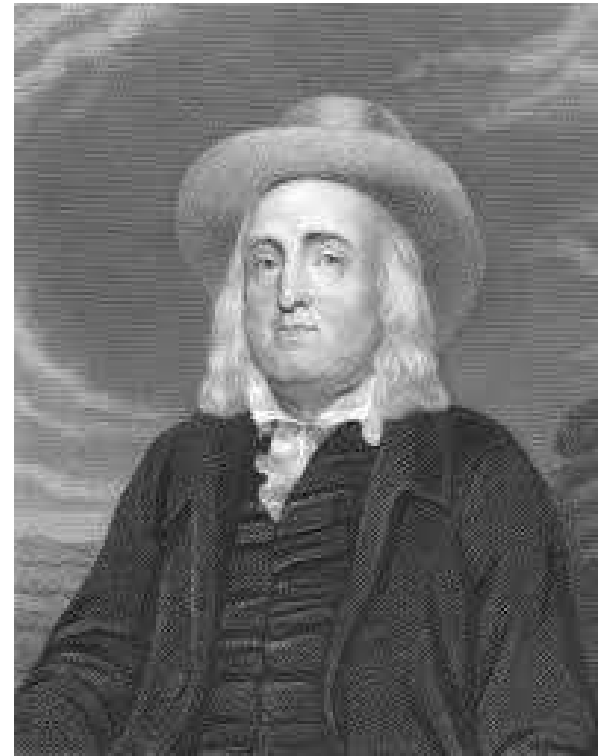
▶ David Ricardo

- Agreed with Malthus, developed a theory called the “**Iron law of wages**”
- Ricardo argued that the bigger the population, the lower wages would be for the working class.



The Utilitarians

- ▶ Thinkers like Jeremy Bentham were called **utilitarians**, believing the goal of society should be the greatest good for the greatest number of people.



This is kind of weird....

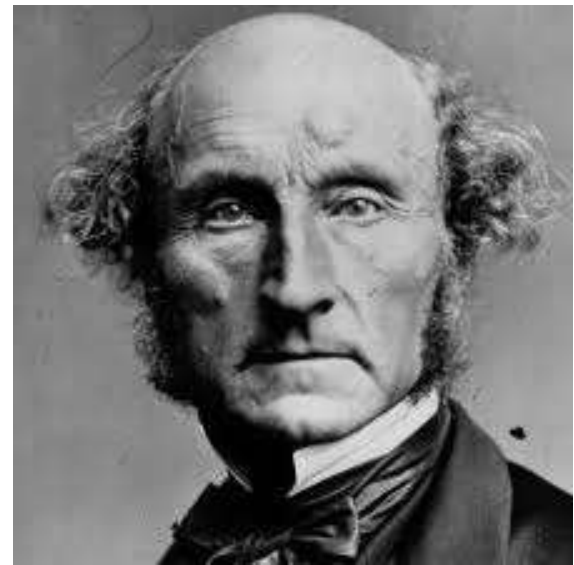
- ▶ “My body I give to my dear friend Doctor Southwood Smith to be disposed of in a manner hereinafter mentioned, and I direct ... he will take my body under his charge and take the requisite and appropriate measures for the disposal and preservation of the several parts of my bodily frame in the manner expressed in the paper annexed to this my will and at the top of which I have written Auto Icon. The skeleton he will cause to be put together in such a manner as that the whole figure may be seated in a chair usually occupied by me when living, in the attitude in which I am sitting when engaged in thought in the course of time employed in writing. I direct that the body thus prepared shall be transferred to my executor. He will cause the skeleton to be clad in one of the suits of black occasionally worn by me. The body so clothed, together with the chair and the staff in the my later years bourne by me, he will take charge of and for containing the whole apparatus he will cause to be prepared an appropriate box or case and will cause to be engraved in conspicuous characters on a plate to be affixed thereon and also on the labels on the glass cases in which the preparations of the soft parts of my body shall be contained ... my name at length with the letters ob: followed by the day of my decease. If it should so happen that my personal friends and other disciples should be disposed to meet together on some day or days of the year for the purpose of commemorating the founder of the greatest happiness system of morals and legislation my executor will from time to time cause to be conveyed to the room in which they meet the said box or case with the contents therein to be stationed in such part of the room as to the assembled company shall seem meet.”
- ▶ http://www.ucl.ac.uk/Bentham-Project/who/autoicon/Virtual_Auto_Icon

This is extraordinarily weird...

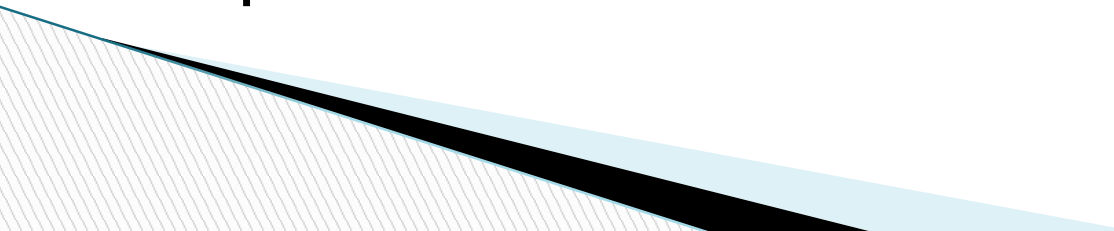


Utilitarians

- ▶ Bentham's chief follower was John Stuart Mill
- ▶ Mill argued that actions were right if they caused happiness, and wrong if they caused pain.
- ▶ Mill did not believe that an unrestricted free market was good, instead he wanted government intervention.



Emergence of Socialism

- ▶ Under **Socialism** the people as a whole, rather than private individuals would own the means of production.
 - ▶ In Winthrop, people own their own homes private ownership, but the town as a whole owns Winthrop High School.
 - ▶ Socialism believed in the basic goodness of human nature, and its goal was a society that operated for the welfare of all.
- 

Emergence of Socialism

▶ Utopians

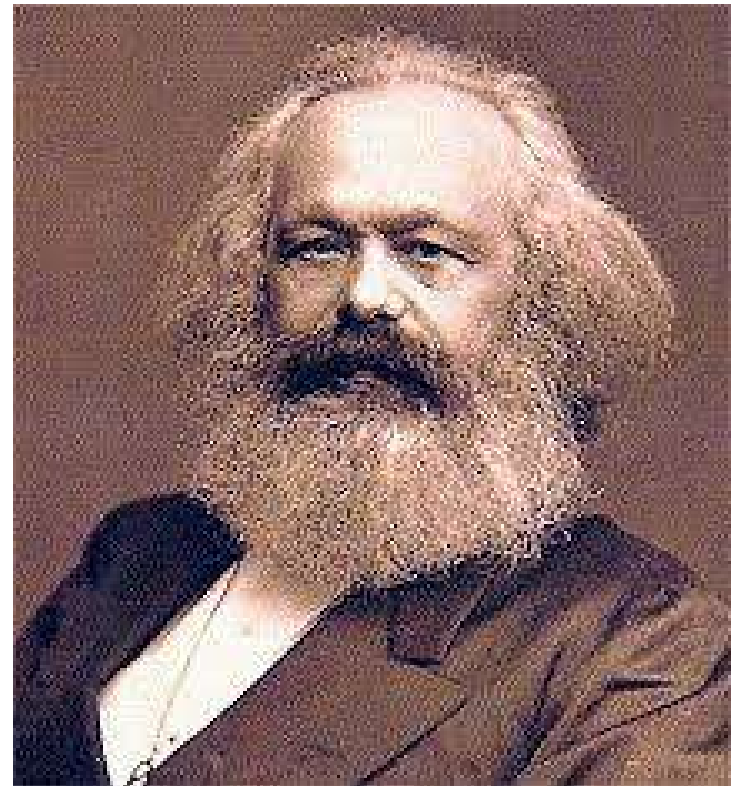
- Early socialists wanted to build self sufficient communities where all work was shared and all property held in common

▶ Robert Owen

- A successful mill owner from Wales, Owen refused to use child labor.
- He built a factory in a town called New Lanark Scotland.
- Showed that an employer could make a profit while still caring for his employees.

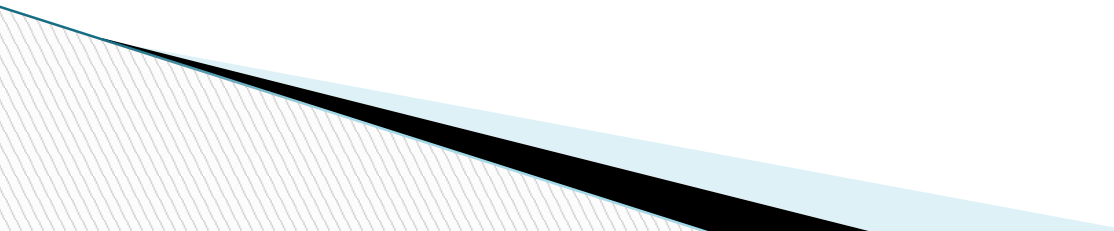
The “Scientific Socialism” of Karl Marx

- ▶ Karl Marx was a German Philosopher who claimed his theory was based on science
- ▶ Marx wrote *The Communist Manifesto* along with Friedrich Engels



The “Scientific Socialism” of Karl Marx

▶ Marxism

- Marx believed the economics was the driving force behind history—all of history was a struggle between those who had (bougeoisie), and those who had not (proletariat).
 - Marx predicted the proletariat would revolt and take control of the means of production, resulting in a society of equality without classes.
 - Marx thought capitalism was evil.
- 

The “Scientific Socialism” of Karl Marx

► Impact

- At first Marxism had very little impact
- As time went on, European socialists embraced Marxism, hoping for a classless society
- In the late 1800s, Marxists emerged and eventually took control of Russia

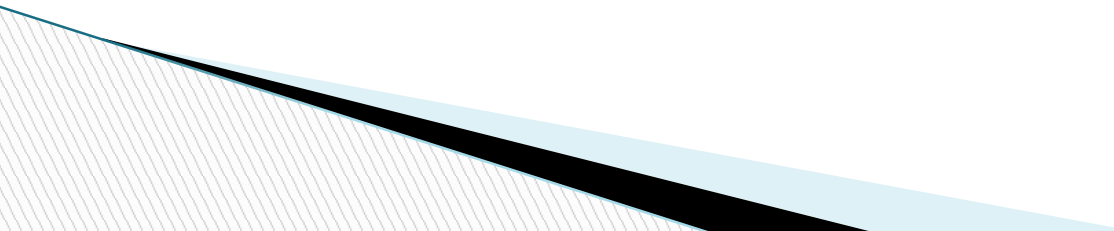


The “Scientific Socialism” of Karl Marx

▶ Weaknesses

- Marx believed his ideas to be based on science, but time proved many of his theories wrong.
- For example, Marxism lost some of its appeal as the industrial revolution led to a worldwide increase in the standard of living.
- Also, Marx was incorrect in believing that workers would unite across borders. Instead, nationalism won out over class loyalty.

Make Sure you Can Answer...

- ▶ What economic ideas helped shape the industrial age?
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