

Chapter 20 - The Industrial Revolution Begins. (1750-1850).

- (1) Dawn of the Industrial Age.
- (2) Britain Leads the Way.
- (3) Hardships of Early Industrial Life.
- (4) New Ways of Thinking.

Watt. Steam Engine.	Fulton. Steamboat.	Karl Marx. Communist Manifesto.	Great Exhibition.
1760.	1803.	1848.	1851.

(1) Dawn of the Industrial Age.

Setting the Scene.

Industrial Revolution has two distinct stages in long, slow process in which Production shifts from simple hand tools to complex machines:

(1) 1750-1850. IR starts in Britain. (2) 1850-1914. IR spreads to Europe/USA.

Turning Point in History.

1750. Most people lived and worked in small farming villages. Made own clothes. Grew own food. By 1850 small villages grew into industrial towns, cities.

New Agricultural Revolution.

Industrial Revolution was made possible because there was an Agricultural Revolution.

Improved Farming.

Crop rotation. Instead of leaving field fallow every three years, rotate crops every year.

Charles Townshend (1674-1738) was politician until 1721. Retired to rotate crops.

New farm machines. 1700s: new iron plows (not wood). 1800s: mechanical reapers.

Jethro Tull (1674-1741) invented seed drill, and idea of planting seeds in straight rows.

Enclosure Movement.

Rich landowners used enclosure or the fencing off of public lands (formerly open). Result was that landowners farmed larger amounts of land and experimented with new crops. More food meant bigger population that meant increased demand of goods (e.g., clothes).

Population Explosion.

Population of Europe between 1700 and 1800 rose from 120 to 190 million.

Declining death rate. Versus rising birth rate. Healthy food. Better hygiene, medical care.

New Technology.

Energy Sources changed. From human muscle. To water wheels. To windmills.

1709. Abraham Darby uses coal to smelt iron or separate iron from its ore.

High quality iron becomes widely used with building of railroads.

1712. Thomas Newcomen develops steam engine powered by coal. Used in mines.

1769. James Watt, Scot, improves on Newcomen. Gets patent on steam engine.

(2) Britain Leads the Way.

Setting the Scene.

1851. Great Exhibition in London symbolizes Britain as first nation to industrialize.

Why Britain?

Historians have identified four factors to explain why Britain led the way:

- (1) Resources. Small island. But big supplies of coal and iron. Ample labor.
- (2) New Technology. Skilled mechanics for new inventions. Capitalization.
- (3) Economic Conditions. Overseas empire made prosperous. Investors.
- (4) Political/Social. Stable government. Strong navy. Protestant work ethic.

Changes in Textile Industry.

1600s. Cotton cloth from India was exported to Britain.

Domestic System: Rural families clean and spun raw wool in own cottages.

Mechanical Inventions revolutionize textile industry. From domestic to factory.

1733. John Kay, clockmaker, invents flying shuttle that speeds weaving process.
1764. James Hargreaves, carpenter, develops spinning jenny (several threads/same time).
1769. Richard Arkwright, barber, dyes hair, invents water spinning-frame (resented!).
1779. Samuel Compton develops spinning mule based on Hargreaves/Arkwright work.
1785. Edward Cartwright, clergyman, builds power loom (water-power weaving action).
1793. Eli Whitney, American, Yale teacher, invents cotton gin. Stolen? Law suits!

Revolution in Transportation.

Production increases. So entrepreneurs need faster and cheaper modes to move goods.

On Land.

- 1800s. George Stephenson develops steam-powered locomotive to pull carriages on rail.
The railroad did not have to follow the course of a river.
So the tracks open up new mode of transportation on land.
1830. First major rail line opens.
From Liverpool to Manchester.

On Sea.

1807. Robert Fulton, American, has success with paddle-wheeled steamboat.
Uses Watt's steam engine (circa 1769).
Goes up Hudson River at record-breaking speed of five miles a hour.
1837. Samuel Morse invents telegraph.
Telegraph is first put under English Channel in 1851.

Looking Ahead.

Industrial Revolution triggers a chain reaction when it gets underway.

More people means more demand for manufactured goods.

More demand means inventors developed more machines to make goods.

As supply of goods increases the prices fall.

Lower prices means more goods are affordable .. and create more consumers.

Industrial Revolution affects not only how goods were made but how people lived.

Industrial Revolution brings economic and social changes around the world.

(3) Hardships of Early Industrial Life.

Setting the Scene.

Remember that 1850 is dividing time between two stages of Industrial Revolution.
Between 1850 and 1914 industry grew rapidly in Western Europe and USA and Japan.

Spread of Industrialization.

Belgium. Had coal, iron. Manufacturing tradition (textiles). Skilled labor.
France. Strong in textiles. Jacquard power loom. Complex patterns. Tariffs.
USA. Lots of resources. Iron. Steel. Passes Britain in 1880s.
Germany. After 1871 national unity becomes rival to USA and Britain.

Other countries where industry growth is not pushed are:

Spain. Italy. Austria. Russia (stays in agriculture).

The New Industrial City.

Industrial Revolution brings rapid urbanization or movement of people to cities.
Small towns around coal or iron mines mushroomed into cities over night.

Problem: A Gulf Divides the Population.

Wealthy and middle-class live in pleasant neighborhoods.

But poor live in slums. Packed in tenements or crowded apartments.

No running water. Community pumps.

No sewage or sanitation system. Wastes and garbage rot in the streets.

The Factory System.

Heart of new industrial city is the factory where the technology of the machine age imposes a harsh new way of life on workers. 12 to 16 hour days. Women workers. Child labor.
No holidays, vacations, sick leave. Unsafe factories: ears, eyes. No accident compensation.

The Working Class.

Protests.

Weavers and other skilled artisans resent the new 'labor-saving' machines. Some smash machines. English rioters: Luddites (Ned Ludd) destroy machines in 1780s.

Methodism.

John Wesley founds Methodist Church (c., 1795). Helps workers (through Sunday-school education) to channel anger from revolution toward social reform.

The New Middle Class.

New middle class comes from merchants investors in factories and skilled artisans.

New middle class values hard work and determination to "get ahead."

New middle class has confidence in itself and little sympathy for poor (maybe lazy?).

Benefits and Problems.

Debate is whether Industrial Revolution was blessing or a curse.

Despite social problems created by Industrial Revolution – low pay, unemployment, dismal living conditions – the industrial age did bring material benefits.

New factories opened that created new jobs. Wages rose. Disposable income rose.

(4) New Ways of Thinking.

Setting the Scene.

Heirs of Enlightenment looked for natural laws to govern world of business and economics.
Thomas Malthus publishes Essay on Principle of Population (1798). Dismal Science.

Laissez-Faire Economics.

Enlightenment physiocrats held that natural laws ran economy that should be left alone.
The economic system, laissez-faire, (Fr. 'let' 'to do') says let people do as they choose.

Legacy of Adam Smith.

Adam Smith (1723-1790). Scottish professor of Logic (1751). Went to London (1776).

1776. Publishes Wealth of Nations.

Thinks his five chapter volume was to be part of bigger book.

Says that even though people act in own self-interest, society as a whole benefits.

Free market produces more goods at lower prices, making affordable to all.

Such capitalism means that government plays no part in economy.

Malthus on Population.

Thomas Malthus (1766-1834). Amiable English clergyman.

1798. Publishes Essay on Principle of Population.

Contends that human population grows faster than food production.

Urges families to have fewer children.

By 1900s population growth was no longer a problem in the West.

Ricardo on Wages.

David Ricardo (1722-1823). English stockbroker.

1817. Writes Principles of Political Economy and Taxation.

Postulates "iron law of wages":

When wages are high, people have more children.

But more children means greater supply of labor.

More labor leads to lower wages and unemployment.

The Utilitarians.

Utilitarianism is idea that goal of society should be greatest happiness for greatest number.

Jeremy Bentham (1748-1832). English philosopher. Starts Oxford at 12.

He supports individual freedom (capitalism) but sees need for government interference.

John Stuart Mill (1806-1863). English philosopher. Follower of Bentham.

He calls for vote for workers and women so they can use political power for reforms.

Emergence of Socialism.

Socialism says people as a whole, not private individuals, should own factors of production.

Utopians.

Early socialists dreamed of 'utopia': no poverty, all treated fairly.

Robert Owen (1771-1858). Sets up utopian factory in Scotland. It works!

Scientific Socialism of Karl Marx.

Karl Marx (1818-1883). German. PhD. Journalist (1842). Émigré to Paris (1843).

Flees to Belgium (1845). Writes (with Engels) Communist Manifesto. (1848)

Marxism. History is class struggle: 'haves' (bourgeoisie) v. 'have-nots' (proletariats).

Looking Ahead.

At first, Marxism gained popularity around the world. Reform movements adopted idea that power should be held by workers instead of business owners. In time, idea failed.

1917. Russian Revolution set up communist-inspired government.

2005. Adam Smith ideas seem to be longer lasting than those of Karl Marx.