

Agricultural and Industrial Revolution

Chapter 25 Section One

Agricultural Revolution

- Early 1700's - wealthy landowners bought up the land of small farmers and enclosed the land with fences and hedges.
- The enclosures were used to try out new seeding and harvesting methods to increase crop yields
- The enclosure movement forced small farmers to become tenant farmers or to give up farming and move to the city

Inventions and inventors of the Agricultural Revolution

- Jethro Tull - one of the first scientific farmers. He invented the seed drill in 1701. The seed drill allowed farmers to plant seeds in well-spaced rows at specific depths
- Crop rotation- improved on the medieval three field system. One year wheat would be planted which would exhaust the soil, next root crops which replenish the soil then barley, clover etc...
- Robert Bakewell- increased mutton output by allowing on his best sheep to breed. Between 1700- 1786 the average weight for a lamb climbed from 18 lbs to 50 lbs.

Effects of Agricultural Revolution

- As food supplies increased and living conditions improved England's population mushroomed boosting demand for food and goods.
- As farmers lost their land to large landowners many became factory workers

The Factors of Production

- Why did the Industrial Revolution begin in England?
- England had the factors of production: Land, Labor, Capital
- Because of the population boom and the shift from rural to urban areas England had a huge labor force
- England was a small country so transportation of goods and raw materials was manageable
- England had an expanding economy with business people and banks willing to invest in new technologies.

Natural resources in England

- England had extensive natural resources that were necessary for industrialization:
 - Water power and coal to fuel new machines
 - Iron ore to construct new machines, factories, tools
 - Rivers for transportation inland
 - Harbors for merchant ships to transport goods

Expanding English Economy

- Business people called entrepreneurs were able to invest in the manufacturing of new inventions
- England has a highly developed banking system that made bank loans available to invest in new machinery and expand operations
- Growing overseas trade, economic prosperity, and a climate of progress contributed to increased demand for goods.

Political Stability in England

- Political stability in Britain gave them a tremendous advantage over their neighbors.
- None of the wars that Britain was involved in during the 1700's were fought on British soil
- Parliament passed laws that protected business and helped the expansion of the English economy.

New Inventions

- The first industry to be transformed by the Industrial Revolution was the textile industry.
- By 1800 major inventions modernized the textile industry
 - 1733- John Kay- invented the flying shuttle which doubled the amount of work a weaver could do in a day.
 - 1764 James Hargreaves invented the spinning jenny which allowed one spinner to work eight threads at one time.

More inventions

- At first the shuttle and spinning jenny were operated by hand until...
- 1769- Richard Arkwright invented the water frame which used water power from rapid streams to drive the spinning wheels
- 1779- Samuel Crompton invented the spinning mule which combined the water frame and the spinning jenny- the spinning mule produced thread that was stronger, finer, and more consistent than earlier spinning machines.

Factories

- 1787- Edmund Cartwright invented the power loom which sped up the weaving process.
- The new inventions were bulky and expensive and took the work of spinning and weaving out of the house and into factories.
- Factories were built by wealthy textile merchants by sources of water because they needed water power

American Cotton Production

- England's cotton came from plantations in the American south in the 1790's
- 1793- Eli Whitney- an American inventor invented the cotton gin which separated the seeds from raw cotton
- 1790 American cotton production 1.5 million lbs
- 1810- American cotton production 85 million lbs.

The Steam Engine

- The steam engine was developed as a source of cheap convenient power
- The earliest steam engines were used in mining in 1705 they used large amounts of fuel and were expensive to run
- James Watt- figured out a way make the steam engine work faster and more efficiently while burning less fuel.
- 1774- Watt and Matthew Boulton joined forces- Boulton was an entrepreneur who paid Watt a salary to develop a better steam engine.

Steam Engines on the water

- Steam was also used to power boats.
- Robert Fulton used a steam engine to power his steamboat and ferry passengers up and down the Hudson river in New York.
- In England 4,250 miles of canals were used to transport raw materials at a cheaper cost

Improvements in roads

- Early 1800's John McAdam- was a Scottish engineer who built roadbeds with a layer of large stones for drainage topped by a layer of crushed rock that was carefully smoothed out.
- Even in rainy weather heavy wagons could travel over these new macadam roads without sinking in the mud.
- Private investors formed companies that built roads and then operated them for a profit.
- People called the roads turnpikes because travelers on the roads had to stop at toll gates to pay a fee in order to use the road.

Development of railroads

- After 1820 the locomotive drove English industry
- 1804- Richard Trevithick hauled 10 tons of iron over nearly 10 miles of track in a steam driven locomotive on a bet.
- Other British engineers improved on his design
- George Stephenson built 20 engines for mine operators in northern England.

George Stephenson builds first Railway in Britain

- 1821- Stephenson began work on the world's first railroad line.
- It opened in 1825 with four locomotives that Stephenson had designed and built
- It ran 27 miles from the Yorkshire coalfields to the port of Stockton
- Entrepreneurs in northern England wanted a rail line to connect the port of Liverpool with the city of Manchester
- 1829- they held a race to see which locomotives would run on the new line
- The Rocket built by George Stephenson and his son won easily hauling 13 tons at 24 miles per hour.

Contributions of Railroad

- Railroads spurred industrial growth in a number of ways
 - 1. Gave manufacturers a cheap way to transport materials and finished products
 - 2. The railroad boom created hundreds of thousands of new jobs for RR workers and miners
 - 3. RR's boosted England's agricultural and fishing industries because their products could be shipped quickly to distant cities.
 - 4. By making travel easier RR's encouraged people to take jobs in cities and lured city people to resorts in the country