

NOTES

Ch. 9 “Life in the Industrial Age”

Section 1 The Industrial Revolution Spreads

~first phase of Ind. Rev. began in Britain, forged from iron & steam

~new phase is based on steel> bridges, buildings, rails & mills

- I. Industrial Powers, emerged in 1800's
 - A. Early Ind. Rev. Britain stood out alone as world's industrial power
 1. Strict rules against exporting inventions
 2. 1807 British mechanic opened factories in Belgium
 - a. Manufacture spinning & weaving machines
 - b. 1st nation outside England to industrialize
 - B. Germany, France, U.S. able to catch up w/ England
 1. Abundant supplies of coal, iron & other resources
 2. Borrowed British experts & technology
 3. Germany became Europe's leading industrial power
 4. U.S. advanced rapidly after Civil War, world leader by 1900
 - C. Eastern & southern Europe lacked resources & capital, slow to develop
 - D. Russia – had resources, but social & political problems slowed industrial development
 - E. Japan – lacked basic resources but industrialized rapidly
 - F. Social changes
 1. Rapid urbanization
 2. Long, difficult & dangerous work for men, women & children
 3. Factory system produced large numbers of goods at affordable prices
 4. Demand for good created jobs
- II. Impact new technology had on industry, transportation & communication
 - A. Technological advances
 1. Henry Bessemer (1856) developed process to purify iron-ore & produce steel
 - a. Used in tools, bridges, railroads, buildings
 - b. Industrialized nations measured success in steel output
 2. Chemicals
 - a. Medicines like aspirin
 - b. Perfumes & soaps
 - c. Chemical fertilizer – increased food production
 - d. Alfred Nobel – dynamite (1806)
 - i. To be used in construction
 - ii. Used in war
 - iii. Nobel Peace Prize
 3. Electricity
 - a. 1800 Alessandro Volta – 1st battery
 - b. Michael Faraday – dynamo, machine to generate energy
 - c. Thomas Edison (1870) – electric light bulbResults> Factories could operate longer hours; cables carried electrical power from dynamos to factories
 4. New methods of production> improved efficiency
 - a. **Interchangeable parts** – identical components could be used in place of one another, simplified assembly & repair
 - b. **Assembly line** – workers add parts to a product as it is moved along a belt from one work station to the nextResults> Made production faster & cheaper
 - B. Transportation advances
 1. Steamships replaced sailing ships

2. Railroad lines connected inland cities, mining regions & industrial cities
 - a. U.S. transcontinental railroad – rail services from Atlantic to Pacific Oceans
 - b. Russia – Trans-Siberian Railroad; Moscow to Vladivostok
 - c. Railway bridges & tunnels across Alps & Andes
 3. Automobile
 - a. Nikolaus Otto – gasoline-powered combustion engine (also used for motorized threshers & reapers)
 - b. Karl Benz (1886) – patent for 1st car, 3 wheels
 - c. Gottlieb Daimler 1st 4-wheeled car w/ gasoline-powered engine
 - d. Early 1900's Henry Ford used assembly line to produce affordable cars
 4. Airplane (1903) Wilbur & Orville Wright (Ohio bicycle makers) flew flimsy airplane at Kitty Hawk, NC
- C. Communication advances
1. Telegraph – Samuel Morse
 - a. Coded messages over wire by electrical current
 - b. 1st telegraph line between Baltimore & Washington, D.C.
 - c. Under-sea cable (1860's) – messages between Europe & North America
 2. Telephone (1876) – Alexander Graham Bell changed communication
 3. Radio (1890) – Guglielmo Marconi; 1st transmitted message from Britain to Canada in 1901

III. Big Business emerged in late 1800's

~entrepreneurs developed new ways to organize businesses

A. Stocks

1. A share in a company sold by owners to investors
2. Stockholders owned a tiny share of a company

B. Corporations

1. Large-scale companies needed more capital
2. Sold hundreds-thousands of shares of stock
3. Businesses owned by many investors/stockholders

C. Monopolies

1. Huge corporate structures that own & control an entire industry or areas of economy
2. German – Alfred Krupp; steel-making
3. U.S. – John D. Rockefeller; Standard Oil of Ohio

D. **Cartel** – group of large corporations join forces to fix prices, set up production quotas & control markets

Results> Reformers called for laws to prevent monopolies & regulate large corporations

Section 2 **The World of Cities**

I. Impact of medical advances in late 1800's

- A. Between 1800 & 1900 Europe's population more than doubled b/c death rate fell
 1. People ate better
 - a. Improved methods of farming
 - b. Better food storage & distribution
 2. Medical advances
 3. Improved public sanitation

B. **Germ theory**

1. Louis Pasteur showed link between microbes & disease
 - a. Vaccines against rabies & anthrax

- b. Discovered pasteurization – process of killing disease-causing microbes in milk
 - 2. Robert Koch (1880's) identified bacteria that caused TB/tuberculosis (lung, respiratory disease)
 - 3. (1914) Yellow fever & malaria traced to microbes carried by mosquitoes
 - Result> With understanding of germs causing diseases, people bathed & laundered clothes more often; improved sanitation
 - C. Hospitals
 - 1. William Morton (1840) anesthetic first used to relieve pain during surgery
 - 2. Dangerous places
 - a. Surgery performed with dirty instruments
 - b. Patients survived operations but died of infections
 - c. Poor going to hospital was like a death sentence
 - d. Wealthy & middle class were treated at home
 - 3. Florence Nightingale – during Crimean War
 - a. Insisted on better hygiene in field hospitals
 - b. Introduced sanitary methods in British hospitals
 - c. Founded 1st nursing school
 - 4. Joseph Lister
 - a. Discovered how antiseptics prevented infection
 - b. Insisted surgeons wash hands & sterilize instruments
 - c. Helped increase life expectancy
- II. Changes in cities in 1800's
- A. City planners laid out cities in organized blocks w/ wide boulevards
 - B. **Urban renewal** – rebuilding of poor areas in cities
 - 1. (1850's) George Haussman built wide boulevards around splendid public buildings in Paris
 - a. Put many people to work > decreased social unrest
 - b. Wide boulevards > harder for rebels to barricade streets (Fr. Rev, 1793, 1830 & 1848)
 - 2. In America
 - a. Wealthy & middle class lived in nice areas outside the cities
 - b. Poor were crowded in slums in cities
 - C. Improving safety & cleanliness in cities
 - 1. Paved streets
 - 2. Gas lamps, then electric street lamps
 - 3. Sewage systems, below streets, had great impact on lives of poor
 - 4. Clean water supplies > combat epidemics of cholera & TB
 - 5. Steel brought skyscrapers, first built by Louis Sullivan
 - D. Slums – urban life remained harsh for the poor
 - 1. Small cramped row houses or crowded tenements
 - 2. High crime rates & alcoholism
 - E. Lure of the city – attracted millions
 - 1. Excitement
 - 2. Promise of work
 - 3. Entertainment – music halls, theaters, opera houses
 - 4. Education – museums & libraries
 - 5. Sports – tennis, bare-knuckle boxing, basketball, soccer, baseball
- III. Working class struggles led to improved conditions for workers
- A. Workers attempts to improve industrial life

1. Protested low wages, unsafe working conditions, long hours, & constant threat of unemployment
 - a. Business owners & govts ignored or put down protests
 - b. Strikes & unions were illegal
 - c. All demonstrations were crushed
 2. (mid 1800's) **Mutual aid societies** – self-help groups to aid sick or injured workers
 3. (late 1800's) All men had the right to vote in most western nations
 - a. Workers won right to organize in unions & bargain for better conditions and work for labor reform
 - b. Germany legalized labor unions (1869)
 4. Govts passed laws to regulate working conditions
 - a. Outlawing child labor
 - b. Banning employment of women in mines
 - c. (1909) British coal miners won 8 hour day
 - d. Old age pensions
 - e. Disability insurance for workers who were ill or injured
- B. Improved **standard of living** – measures the quality and availability of necessities & comforts in a society
1. Ate more varied diets
 2. Lived in better homes
 3. Dressed in inexpensive mass-produced clothes
 4. Improved health
 5. Some workers moved to suburbs & traveled to work on subways or trams

Section 3 **Changing Attitudes and Values**

- I. Values that shaped the new social order
 - A. Before 1800's there were two social classes
 1. Nobles both were tied
 2. Peasants to the land
 3. Very small middle class
 - B. Late 1800's
 1. Small upper class, nobility & super-rich industrialists
 2. Middle class – group that grew the fastest in 1800's
 - a. Upper middle class – doctors, scientists, lawyers
 - b. Lower middle class – teachers, office workers, shop keepers
 3. Lower classes
 - a. Working class – large numbers in U.S. & Western Europe, lived in tenements near factories
 - b. Peasants/farmers – more in less industrialized nations
 - C. Middle class values/ way of life> **RESPECTABILITY**
 1. Families lived in large house or apartment house
 2. Strict code of etiquette – rules of social behavior
 - a. How to dress, when to give dinner parties, how long to mourn, when to write letters, etc
 - b. Children “to be seen, not heard”
 - c. Even small middle class homes had servants
 3. Courtship & marriage
 - a. Families had much to say as to whom children married
 - b. Falling in love was becoming more accepted
 - c. Strict rules of courtship

4. **Cult of domesticity** – idealized women and the home; woman's place was in the home
 - a. "Home sweet home"
 - b. Ideal woman = tender, self-sacrificing care-giver, nest for children, peaceful home for husband

II. Women and educators tried to bring about change

A. Women campaigned for variety of rights

1. Fairness in marriage, divorce & property laws (won right to own property in late 1880's)
2. Supported **temperance movement** – limit or ban use of alcoholic beverages
3. Before 1850, women leaders in union movement, abolition of slavery > made women realize their own laws were restricted
4. **Women's suffrage** – women's right to vote, became an issue in late 1800's
 - a. Faced intense opposition (cult of domesticity)
 - b. Edges of western world, New Zealand, western U.S. territories gave women the right to vote before 1900

B. Public education & higher education

1. Late 1800's reformers got many govts to set up public schools
 - a. Require basic education for all children
 - b. Three R's – reading writing & 'rithmetic > better citizens
 - c. Need for literate work force
 - d. Taught punctuality, obedience to authority, disciplined work habits & patriotism (religion in European schools)
2. Secondary schools (high schools in U.S.)
 - a. Classical languages (Latin & Greek), history & math
 - b. For middle class sons
 - c. Middle class daughters attended finishing schools – marry well & be better wives
3. Colleges & universities
 - a. Most students were sons of upper & middle classes
 - b. Curriculum – ancient history, languages philosophy, religion, law
 - c. Late 1800's chemistry & physics added; engineering schools opened
 - d. 1840's few women's colleges: Bedford College, England; Mt. Holyoke, U.S.

III. Science challenged existing beliefs

~researchers had startling theories about the natural world

A. Atomic theory – John Dalton (early 1800's) modern atomic theory

1. Showed how different kinds of atoms combine to make all chemical substances
2. Dmitri Mendeleev – table of all elements according to weight basis for periodic table

B. Age of earth – (1820) Charles Lyell Principles of Geology

1. Evidence that the earth was formed over millions of years
2. (1856) workers in Neander Valley in Germany found remains of prehistoric people – Neanderthals

C. Charles Darwin (1859) published On the Origin of the Species

1. All forms of life evolved into present state over millions of years
2. Theory of natural selection
 - a. Used Thomas Malthus's (economist) idea that all plants & animals produced more offspring than the food supply could support
 - b. Members of species compete to survive
 - c. Nature "selected" those with best physical traits to adapt

- d. Survival of the fittest
 - 3. Brought debates between scientists & religious leaders b/c Darwinism disputed creationism (debate continues to the present)
 - 4. Social Darwinism – used Darwin's theory
 - a. Survival of the fittest in war weeded out weak nations
 - b. Survival of the fittest in business put weak companies out of business
 - c. Encouraged **racism** – belief that one racial group is superior to another
 - i. Some Europeans & Americans claimed success of western civilization was b/c of superiority of white race
 - ii. Used this as reason for dominating colonial holdings & pushing Nat. Am. onto reservations
- Result> These ideas led to global expansion/imperialism, discrimination & segregation

IV. Role of religion in urban society

- A. Christian churches & Jewish synagogues remained center of communities; urged reforms
- B. Catholic priests & nuns set up schools & hospitals in urban slums
- C. Jewish organizations like B'nai B'rith provided social services
- D. **Social gospel** – movement of Protestant Christians to social service
 - 1. Reforms in housing, health care & education
 - 2. William & Catherine Booth (1878) founded the Salvation Army in London

Section 4 “A New Culture”

- I. Themes that shaped romantic art, literature & music
 - A. **Romanticism** – cultural movement which glorified nature (poet, William Wordsworth) & excited strong emotions
 - 1. 1750-1850, literature & arts
 - 2. Rebelled against Enlightenment emphasis on reason & progress
 - B. Romantic hero – mysterious & sad
 - 1. Lord Byron – English poet
 - a. Lived life of romantic hero
 - b. His poetry was so popular, heroes were called “Byronic”
 - 3. Goethe – romantic poem, *Faust*
 - 4. Charlotte Bronte – Jane Eyre
 - C. Romantic writers wrote about history, legends & folklore
 - 1. Sir Walter Scott – Scottish clans & medieval knights
 - 2. Alexander Dumas – The Three Musketeers
 - D. Romantic music – stirred deep emotions
 - 1. Beethoven – 1st to use broad range of instruments in modern orchestra
 - 2. Chopin – Polish peasant dances to convey sorrows & joys of people living under foreign occupation
 - E. Romantic painters
 - 1. Turner (p. 240 in text) – landscapes to capture beauty & power of nature
 - 2. Delacroix – dramatic action of French revolution
- II. Realists responded to industrialized world
 - A. **Realism** – attempt of artists & writers to show the world as it is, the harshness of city & rural life
 - B. Novelists
 - 1. Charles Dickens
 - a. Lives of slum dwellers, factory workers, including children

- b. Oliver Twist – shocked many middle class readers w/ how Dickens showed poverty, mistreatment of children, & urban crime
 - 2. Victor Hugo – Les Miserables
 - C. Drama – Norwegian playwright, Henry Ibsen
 - D. Realist painters – ordinary subjects, like working class men & women
 - 1. Gustave Courbet (p. 261 in text)
 - 2. Eakins
- III. Changes in visual arts
 - A. Photography (p. 240 in text)
 - 1. Louis Daguerre & William Fox Talbot
 - 2. Posed portraits (p. 240 in text) or faraway places (p. 251)
 - 3. Matthew Brady – horrors of American Civil War
 - B. **Impressionism** (1880's) – capture first fleeting visual impression made by a scene or object
 - 1. Brushed strokes of color side by side without blending
 - 2. Claude Monet (p. 262) and Edgar Degas
 - C. Postimpressionist – variety of styles
 - 1. Seurat – small dots of color to define shapes of objects
 - 2. Vincent Van Gogh – sharp brush lines & bright colors (p. 268)
 - 3. Gauguin
 - a. Went to Tahiti
 - b. Painted “primitive” folk art
 - c. Black outlining of shapes to show intense feelings & images