6 – Industrialization Shapes Europe

Special Note on Periodization

Periodization is done based upon many different markers in history. One historian may use political markers such as the Peace of Westphalia, while another may choose economic ones, such as the opening of transatlantic trade and the Columbian Exchange. The AP European History Curriculum Framework uses the political markers of the Peace of Westphalia, the Congress of Vienna, and the outbreak of World War One. Unfortunately, social and economic movements do not always fit into the same delineations as political history. The largest problem for the traditional historian in periodization posed by the framework is contained in this chapter. The author believes that it is more important to preserve the narrative of industrialization than to alter the narrative to fit the framework. Therefore, special attention will be given to the periodization outlined in the AP European History Curriculum Framework in this chapter to help avoid confusion and to give you ideas about how to display the skill of periodization in your essay. The *AP European History Curriculum Framework* was written to emphasize the use of historical thinking rather than memorization of facts. The authors believe that by offering an alternate sense of periodization compared to that framework, they will enhance your understanding of that skill and of the many different markers that can be used with periodization.

Great Britain had begun industrialization by the 1790s and saw industrial output soar and demographics change mightily before the end of the Napoleonic Wars in 1815, when Period 2 ends according to the *AP European History Curriculum Framework,* but the Industrial Revolution was just getting into full swing at that point. As yet, parts of Europe had not even seen enclosure or an agricultural revolution, much less an industrial one, so the slow cultural diffusion of enclosure and then industrialization, as well as the fact that its implementation came with bursts and lulls, make fitting this chapter into the framework a challenge. The issues of *urbanization* and the growth of *consumerism* are of particular concern as they occur over both time periods. This chapter addresses the following Key Concepts from the *AP European History Curriculum Framework:*

KEY CONCEPTS AND OVERVIEW

KEY CONCEPT 2.4 The experiences of everyday life were shaped by demographic, environmental, medical, and technological changes.
KEY CONCEPT 3.1 The Industrial Revolution spread from Great Britain to the Continent, where the state played a greater role in promoting industry.
KEY CONCEPT 3.2 The experiences of everyday life were shaped by industrialization, depending on the level of industrial development in a particular

location.

KEY CONCEPT 3.3 The problems of industrialization provoked a range of ideological, governmental, and collective responses.

Overview

An Industrial Revolution fostered into existence by the growth of commerce, the development of capitalism, the introduction of improved technology, and the unique political climate in Britain during the eighteenth century, changed life in Western Europe in the 1800s more profoundly than had the French Revolution. The landowning aristocracy, which had its origins in the early Middle Ages and whose decline had begun with the growth of a commercial and professional middle class, lost more wealth and political power with the inception of a spectacularly wealthy capitalist class. The lives of the mass of Europeans shifted from the farm to the factory, from the predictable rhythms of a rural existence to the grinding and impersonal poverty of the industrial cities. Along with the capitalists, a new *proletariat,* or working class, was created, and a whole new set of social and economic doctrines sought to explain their rights and better their lives. The family was reshaped, concepts of time were changed, and trade unions and other organizations promoting social welfare were created. The European balance of power was shifted multiple times by industrial production as first the United Kingdom, then Germany dominated industrial output and thus gained international power. Because industrialization can also create the capability to reshape the world, industrialization became a national project with ramifications for those who advanced the slowest or the most quickly. Added to the "isms" that grew out of the French Revolution-such as republicanism, conservatism, and nationalism-were *Socialism* and *Marxism.* By the last third of the nineteenth century, an "Age of Progress," a technological revolution, had altered the Western world and was to lead the way into the woes and wonders of the twentieth century.

Industrial Revolution

Industrialization was never really a "revolution" or a violent, drastic change but, rather, industrialization has been a continuous and usually gradual process throughout human existence, from the use of the first stone tools to the development of high technology. The so-called *Industrial Revolution* was a period of rapid development, roughly between 1780 and 1830, during which new forms of energy from coal and other fossil fuels powered machines rather than muscles, water, or wind. The advent of the steam engine allowed massive amounts of energy to be exerted by machinery, such as the water frame and power looms, that appeared in large factories, where most textile workers began to work. This contrasted markedly with pre-industrial society where textiles were made in cottages from thread spun on wheels and fabric was woven on human-powered looms.

Industrialization began in Britain in the second half of the eighteenth century and moved to France, Holland, Belgium, and the United States in the second decade of the nineteenth. It began in Germany, Austria, and Italy in the middle of the nineteenth, then arrived in Eastern Europe and Russia at the end of the century and in parts ofAsia and Africa well into the twentieth. It carries on today as new technologies continue to reshape society.

The Agricultural Revolution in Britain

After the Glorious Revolution of 1688, British landowning aristocrats dominated Parliament and passed the *Enclosure Acts,* which fenced off the *medieval common lands.* The *Enclosure Movement* is the least understood and possibly most important change that happened to legal rights in Europe during its history. It took centuries to complete and radically changed the relationship people had with the land, production, and each other.

- The *Enclosure Movement* put into place the last of the four needed ingredients for capitalism: **land, labor, capital, and markets** (entrepreneurs and technology).
- Allowed the struggle for money to be based on factors other than just birth and luck.
- Opportunities for advancement were there for anyone who had a profitable idea and a work ethic.
- The modem economy began.
- The struggle between capital and labor became a true battle.

RESULTS OF THE ENCLOSURE MOVEMENT

- Large landowners became prosperous; they invested in technology, meaning machinery, breeding, improved planting methods. Crop yields and livestock production soared.
- Surplus production enabled agriculture to support a larger population in the cities.
- The population of Britain doubled during the eighteenth century.
- Small farmers who were displaced by the Enclosure Movement moved to the cities and made up the growing force of factory workers (the *industrial proletariat).*

Demographic Changes Altered Lifestyles

The population explosion of the sixteenth century resulted in both food shortages and food gluts throughout Europe during the seventeenth and eighteenth centuries, resulting in mortality disasters. The European marriage pattern, which limited family size, became the most important check on population levels, although some couples also adopted birth-control practices to limit family size. By the middle of the 1750s, better weather, improvements in transportation, new crops and agricultural practices, less epidemic disease, and advances in medicine and hygiene meant a reduction of, or end of, the cycle of feast and famine. By the start of the nineteenth century, reductions in child mortality and increases in life expectancy led to the emergence of new attitudes toward children and families.

Economic motivations for marriage, while still important for all classes, diminished as the middle-class notion of companionate marriage began to be adopted by the working classes.

This demographic revolution, along with the rise in prosperity, produced advances in the general standard of living that allowed cultural and intellectual growth for the masses.

- Greater prosperity was associated with increasing literacy, education, and richer cultural lives.
  - Growth of publishing and libraries.
  - Founding of schools.
  - Establishment of orchestras, theaters, and museums.
- As the nineteenth century began, it was clear that a large percentage of Europeans were better fed, healthier, longer lived, and more secure and comfortable in their material well-being than

at any previous time in history.
    - This relative prosperity was offset by increasing numbers of the poor throughout Europe.
        - Poor depended upon charitable resources.
        - Distressed government officials and local communities.
- A *consumer revolution* changed the lives of the European people as it spread from the Dutch and British, first to Western Europe, then more slowly southward and toward the East.
    - Consumers demanded new items such as porcelain, mirrors, manufactured cotton goods, and even printed art.
    - New leisure venues, such as taverns and opera houses, attracted these emerging consumers.
    - Blood sports and betting also common entertainments for the working classes.
- Family patterns and ideas about privacy began to change:
    - Explosion of illegitimate births between 1750 and 1850 throughout Europe.
        - Labor became more mobile and social punishments for moral infractions were no longer easy to enforce.
        - Infant and child mortality decreased, and commercial wealth increased; families could dedicate more space and resources to and child-rearing, as well as to private life and comfort.

Urbanization

Perhaps the most important change that took place during the nineteenth century era of industrialization was the huge migration from the rural village to the relative anonymity and fast pace of the cities. A trend that took centuries to spread throughout Europe, and one that is still occurring in parts of the world today, *urbanization* is a change that has reshaped human existence.

- Communal values were eroded when families that did not know each other migrated from villages to the big cities.
- At first, there were areas in cities with concentrations of many poor people, which led to a greater awareness of poverty, crime, prostitution, and other social problems, causing many to want better policing of those living on the margins of society.
- Cities experienced overcrowding and filthy living conditions.

- Rural areas suffered labor shortages and weakened communities.
- Social activists brought the problems of the poor to light.
- Cities were redesigned with urban planning and zoning.
- Labor unions were established.
- Governments responded to the problems of urbanization.

The last four fit into Period 3.

Technological Advances

Inventions of new machines and improvement of production processes throughout the eighteenth century made large-scale production possible in *textile manufacturing* and *coal mining.* The *steam engine* revolutionized transportation.

THE SCARCITY OF ENERGY

By the eighteenth century, most of Britain's forests were gone, and its supply of wood for fuel nearly depleted. The British were importing wood from Russia. *Coal,* plentiful, but traditionally shunned as a fuel because of its pollution of the air, gradually replaced wood as both a fuel and for industrial processes. Most British coal was mined near the coasts.

- The most profitable energy source humans had yet found, producing a calorie extraction ration to yield result, at worst, 1:27 and possibly 1:200.
    - This meant that for every calorie invested in mining they got 27-200 calories of energy back.
    - Fossil fuels became the way for Europe to power a way to reshape the world.
- Mines kept filling with water, so pumps were needed to empty them.
    - The early *steam engines,* such as Thomas Newcomen's clumsy contraption, a maze of rods and leather straps, used heat from burning coal to boil water that made steam power to set the engine in motion; they were employed as pumps in mines.
    - *James Watt* in 1763 saw the problems of the earlier engines, such as those of Newcomen and Thomas Savery (that they lacked a condensing chamber), and created an improved steam engine that became a great success in Britain.
        - Revolutionized every mode of production and transportation,

starting with mining, then the textile industry, and culminating in the railroad.

The mastery of coal, then oil and natural gas, gave Western Europeans the power to dominate the world and to improve the lives of workers, who could now accomplish much more with machines powered by fuel than by using animals, water, and wind.

TEXTILES

The story of the textile industry mirrors that of industrialization. In many ways, the textile industry was the first to be industrialized, so it is often tied to the teaching of this unit. Secondly, everyone needs clothes, so making them more quickly and less expensively allowed for huge profits and generated a consumer market and a feeling of consumerism. What follows is a list of important events in the development of the textile industry that are often asked about on the exam:

- The *fly shuttle* (John Kay, 1733) cut manpower needs on the looms in half.
- The *spinning jenny* (James Hargreaves, 1764) mechanized the spinning wheel.
- The *water frame* (Richard Arkwright, 1769) improved thread spinning.
- Use of the *steam engine* (Arkwright, 1780s) powered the looms and required factory production of textiles instead of domestic industry.
- The *cotton gin* (Eli Whitney, American, 1793) separated seed from raw cotton fiber and increased the supply of cotton, which was spun into thread and then woven into cloth.

COAL

- *Steam pump* (Thomas Newcomen, 1702) rid coal mines of water seepage.
- *Condensing chamber steam engine* (James Watt, 1763).
- Plentiful coal boosted iron production and gave rise to *heavy industry* (the manufacture of machinery and materials used in production).

TRANSPORTATION AND COMMUNICATION

New efficient methods of transportation and other innovations created new industries, improved the distribution of goods, increased consumerism, and enhanced the quality of life.

- The *steamboat* (Robert Fulton, American, 1807).

Marker
From this point until the "Theories on Economics" section, everything covered is in Period 3, but some of it is called for in both periods.

- The railroad steam locomotive (George Stephenson's Rocket, 1829).
  - Both the *steamboat and steam locomotive* enhanced an already-efficient system of river transportation that had been expanded in the eighteenth century by a network of canals.
  - The canals meant that transportation was cheap and easy for most of the nation, leading to trade networks and higher demand for goods as well as for higher transportability of resources.
  - Together they opened new sources of raw materials and new markets for manufactured goods, and they made it possible to locate factories in population centers.
  - The railroad building boom, from 1830 to 1850, brought about massive social and economic changes in Britain's largely agrarian economy.
  - The ease of transport encouraged rural workers to move to the cities.
  - The lower costs of shipping goods in bulk fostered expanding markets.
  - The railroad was a culminating invention of the Industrial Revolution because it utilized steel and a steam engine, and was so massive that it induced many workers to learn the skills needed for an industrial society.
  - It also allowed the creation of *mass marketing* through the use of catalogs.
  - Refrigerated rail cars added much to the ability to feed the world cheaply.
  - Gained the ability to more easily gather raw materials.
  - Led to the advent of trolleys, streetcars, and eventually subways, which opened the cities to new designs.
- New technologies and means of communication and transportation-including railroads – resulted in more fully integrated national economies, a higher level of urbanization, and a truly global economic network.
    - Streetcars and trolleys revolutionized the cities and allowed

their redesign.
    - Bicycles allowed the common person some freedom of transportation at an affordable price.
    - Automobiles, and eventually airplanes, would complete the transportation network by the advent of the First World War in 1914.
- Communication advanced notably with the invention, first of the telegraph, then the radio and telephone.

OIL

By the end of the nineteenth century, the refinement of petroleum allowed its use as a fuel for the newly developed *internal combustion engines* that propelled automobiles, locomotives, and even ships, and also for heating and industrial processes.

Britain Was First in Industrialization

Great Britain was the first nation to industrialize for many reasons, not the least of which was the availability of coal, the energy source that powered the first Industrial Revolution. The Continent did not see industrialization until after the end of the Napoleonic Wars, which ravaged the continent for the first 15 years of the nineteenth century. Why was the first nation to industrialize?

- Stable governments and government institutions supported business.
- Availability of coal, iron ore, and a shortage of wood.
- High levels of economic freedom.
- Economic institutions and human capital were available there.
- No wars at home.
- Enclosure made land, labor, markets, and entrepreneurship available.
- The British government supported industrialization with financial rewards for inventors.
- Britain already had a strong network of canals and roads.
- Private businessmen created many of the inventions and networks needed to
- industrialize.

After the British industrialized, they tried to keep their methods of production a secret, and banned engineers from foreign travel. However, after the defeat of Napoleon, industrialization spread to Europe through people such as Fritz

Harkort, who made steam engines in Germany. The Continent slowly caught up to Britain after she invited the world to see her wonders at the Great Exposition of 1851, held in *The Crystal Palace,* London, an exhibition venue built for the exposition. The British gave financial awards to inventors and did everything possible to promote industry within the British realm.

Nations on the Continent Followed Later

PRUSSIA: The state became a leader of a unified Germany, which rapidly industrialized with strong government leadership and some industrial leaders.

- The *Zollverein,* or the Prussian-led trade union of German states, allowed them to unify their efforts at industrialization
- *Friedrich List* was a writer and philosopher who believed manufacturing was the primary means of increasing people's well-being and relieving poverty, hence it is the duty of the government to improve industry;
  - wrote National System of Political Economy;
  - Conceived of and advocated for the Zollverein, or German customs union, created in 1834.
- For the first time, goods were allowed to move within German states without tariffs. Still-high protective tariffs on foreign goods (from outside the Zollverein).
- Helped to develop growing German nationalism.
- Fritz Harkort got ideas for machinery from Britain.
  - Known as the "Watt of Germany," he borrowed materials and hired foreign workers to build steam engines in Germany.
  - Roads too bad to deliver them fully assembled.

FRANCE: The state led a slower industrialization with less dislocation of traditional methods of production in order to try to prevent societal upheaval. The government supported banks, canals, and a national railroad.

SOUTHERN AND EASTERN EUROPE: A combination of factors, including: lack of resources, feudal traditions, geography, the persistence of serfdom in some areas, and lack of government sponsorship accounted for eastern and southern Europe's lag in industrial development.

Results of the Industrial Revolution

- The most significant result was the increased production and availability of manufactured goods.

- Material prosperity increased because there were cheaper high-quality goods.
- Increased consumption led to more jobs.

- Factory workers lived in poverty on low wages.
  - Housing was in dismal tenements.
  - For the first half of the nineteenth century, entire families, including children from age five up, worked 14 hours a day under unsafe and unhealthy conditions.
  - Crowded slums were worsened by the absence of public services in cities that had expanded too rapidly.
  - Although these living conditions did not differ much from those under which people had lived for centuries on farms, the *concentration of the population* made them more unhealthy.
  - This visibility of poverty in the cities led thinkers to ponder the causes of poverty and prompted the institutions of society to push for its alleviation.
    - The *Sadler Commission* in Great Britain helped initiate legislation to improve working conditions in factories.
- *Urbanization* was one of the Industrial Revolution's most important socioeconomic effects.
  - Working class injustices, gender exploitation, and standard-of-living issues became the nineteenth century's greatest social and political dilemmas.
  - Literally tens of millions of people moved from the countryside to the cities as the factory system replaced the domestic system
  - The family structure changed greatly in that productive work was taken out of the home and to the factory, and children were separated from their families and rural settings
  - Gender roles changed
    - Women's work was seen as less valuable and was increasingly associated with domestic duties
    - Men were separated from wives and children, leaving home to go to work or working in different factories
- By the end of the century, wages and the quality of life for the working class improved because of laws restricting the labor of children and women, creating social welfare programs, and promoting improved diet

and the use of birth control.
    - The many reform laws that restricted the labor of women and children included:
        - The Factory Act of 1833
        - The Mines Act of 1842
        - The Ten Hours Act of 1847
- The Industrial Revolution may have prevented a large-scale human tragedy by increasing production, but the filthy conditions of crowded city life and the grinding poverty of the cities led many reformers, such as *Edwin Chadwick,* to call for changes.

Effects on Class and Gender

Two new overall classes developed as a result of the Industrial Revolution: *industrialists/ capitalists* and *factory workers.* However, the reality was that there were many levels of class distinction within each of these overall classifications of class and, thus, class distinctions became more important at the time.

- There was a huge divide between the *bourgeoisie,* the servant-keeping middle class, and the *proletariat,* or working class.
- The division oflabor by gender was much more pronounced among the upperclasses, where women were homemakers, than in the lower classes, where women often had to work outside the home.
- The gap between wealthy and working classes remained enormous.
    - 5 percent of British households received 33 percent of all income.
    - 20 percent of households made 50-60 percent of British income.
    - 80 percent of the population shared 40 percent of the income.
    - The competitive nature of the markets led many of the factory owners to offer low wages for long hours, to create poor and unsafe working conditions, and to employ child labor.
    - The rigid discipline of factory work contrasted with the rural pace of farm work that most of the laborers had been accustomed to.
    - Not until the mid-nineteenth century did the standard ofliving improve for the average industrial worker.
    - *Child labor laws* were enacted after the first three decades of the nineteenth century to limit the number of hours children could be required to work.
    - A gender division of labor emerged.

        - Men became the main breadwinners, while married women tended to stay home to raise the children.
        - Jobs available to women were "dead-end" and poorly paid.
        - The early attempts of workers to organize were met with hostility from industrialists and anti-union regulations from governments, and had very limited success.
- Class diversity was remarkable, even within the traditional classes.
    - The upper class was created when the newly wealthy industrialists intermarried with the fading nobility to create a new top notch in European society.
    - The middle class, or *bourgeoisie,* saw huge diversity:
        - Tended to own homes;
        - Usually made about $10,000/year while the poor made $400;
        - Spent 25 percent on food and 25 percent on servants;
        - Victorian behavior pattern emerged as the norm.
- Drinking, gambling, and sex condemned as vices.
- Hypocritically ignored in private.
- Age becomes one of the most sexually repressed yet privately perverted.
    - Included industrialists, bankers, white-collar workers, bureaucrats, shopkeepers, business owners, and technical workers.
    - The Lower Class or *proletariat,* which also had huge diversity, totaled about 80 percent of the population,
        - Top of the lower classes tried to emulate the upper classes' Victorian behavior;
        - Many different levels of lower classes with Labor aristocracy or those who could hire and fire at the top;
        - Skilled workers, such as plumbers or masons, were next;
        - Semi-skilled laborers, such as carpenter's assistant;
        - Day laborers did jobs for a day's pay, such as loading ships;
        - Domestic servants were low on the level of working class workers, but were relatively well paid, and many young women spent time as domestic servants.

Leisure Time

Leisure time centered increasingly on the family or small groups, concurrent with the development of activities and spaces to use that time. Some of the activities included:

- Enjoying the parks.
- Attending sporting events.
- Going to the beach.
- Shopping in department stores.
- Visiting museums.
- Attending operas and the theater.

Reforms Began in the Cities

The rapid growth of cities during the Industrial Revolution necessitated urban reform to improve conditions that had existed for centuries: poor sanitation and other services, overcrowded housing, inadequate transportation. Influenced by *Jeremy Bentham (1748-1832),* whose philosophy of *utilitarianism* emphasized "the greatest good for the greatest number," city planners and urban reformers redesigned the many European cities and initiated a public health movement to improve urban life for all classes.

- The Chadwick Report of 1842 indicated that British citizens were living in filthy unsanitary conditions that were spreading disease.
  - Calculated that installing sewage and water systems in British cities would be less expensive than exporting the filth by other means.
  - Cholera epidemic broke out after its release, supporting its conclusions.
  - Cholera used to create the Public Health Act of 1848.
- Paris redesigned between 1853 and 1870 by Georges Haussmann.
  - First urban planning in Europe.
  - Slums destroyed.
  - Public transportation created.
  - Zoning laws passed.
    - Shopping districts at street level with housing above.
    - Large town homes.
    - Many large roundabouts.
    - Parks and open spaces added.
  - Sewage and water systems added.
  - Soon followed by electricity.
  - Broad avenues to prevent revolutionary barricades.
  - Other cities such as Vienna followed the French example.

- Standard of living improved for most Europeans from the middle of the nineteenth century and into the early twentieth.
- Disparities in wealth between the classes led to conflict between them.
    - Encouraged the growth of political radicalism.
    - Hierarchies of wealth and status existed among both the middle and working classes.
- Relegation of women to menial jobs or to child raising fostered a women's rights movement.
    - First wave of *feminism* emerged.
    - Goals included gender equality in opportunity, legal and voting rights.

Theories of Economics

The competing economic theories below mostly emerged during Period 2, but were hotly contested during Period 3, so you must be familiar with all of the theories and theorists below. In reality, all of them, except for the *Comte de Saint-Simon,* Louis Blanc, and Karl Marx did most of their work during Period 2.

- *Adam Smith* (see page 176) can be considered the first modern economist.
    - His *Wealth of Nations* has been called the "Bible of capitalism" and is the foundation for *classical* or laissez-faire economics, which opposed the regulations imposed by mercantilism by arguing that certain natural laws, such as *supply and demand,* govern an economy and should be free to operate.
    - People follow their own "enlightened self-interest," without the interference of government in the economy.
    - This private initiative will result in benefits to all in society.
- *Thomas Malthus* (176&-1834) was the first of the classical economists to try to explain why the mass of people did not benefit from the operation of the "natural laws" of economics.
    - Poverty existed, he said, because the population increased at a geometric rate while the food supply increased arithmetically.
    - Believed that poverty was a divine punishment for humankind's lust.
- *David Ricardo* (1772-1823) introduced the *Iron Law of Wages:* the

natural wage is that which maintains a worker's subsistence.
    - When labor is in demand, the wage will increase, the worker will prosper, the size of families will increase, and the general population will grow.
    - The result will be more workers competing for fewer jobs and inevitable starvation.
    - Believed government attempts to change this only led to greater suffering.
- *Utopian Socialists* rejected the *dismal science* of the classical economists and sought solutions to the plight of the masses.
    - *Robert Owen* (1771-1858): a Scottish textile manufacturer whose humane working conditions – shorter workday, decent housing, and free education – served as a model for capitalists who wanted to make a profit without exploiting workers.
    - The *Comte de Saint-Simon* (1760-1825):one of the early French founders of *socialism.*
        - Helped define the movement by advocating *public ownership of factories.*
        - Wanted a professional managerial corps to run factories: the *technocrats.*
        - Coined the slogan, "From each according to his ability, to each according to his need," an idealistic but vague proposal for a *planned economy.*
    - *Louis Blanc* (1811-1882): had a more practical approach than other early French utopian socialists.
        - Urged workers to fight for universal suffrage and to overthrow the state peacefully.
        - Believed the government should set up workshops and factories to guarantee full employment.
        - Ideas had an opportunity to be tested when he briefly became a leader of France after the Revolution of 1848.
- *Karl Marx* (1818-1883): the primary proponent of the "class struggle" model of history.
    - His *Communist Manifesto,* written with *Friedrich Engels* (1820-1895) during the revolutions of 1848, called for radical solutions to the dilemma of mass poverty in the industrialized world.
    - *Das Kapital,* the first volume of which was published in 1867,

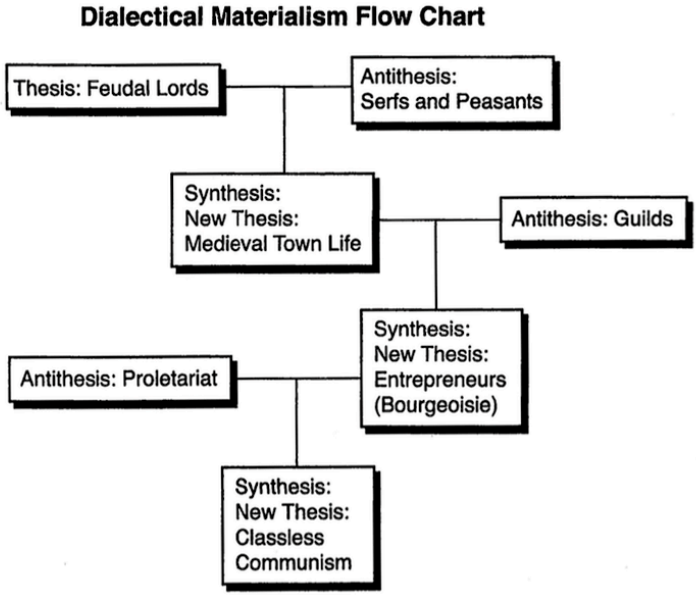
offers a complete analysis of capitalism and an explanation of communism.

Marx's Theories

Hegelian dialectic (so named after the German philosopher Georg Hegel): In every historical period a prevailing ideal, *thesis,* conflicts with an opposing ideal, *antithesis,* and results in a new ideal, *synthesis.* This becomes the thesis of the next period and the process continues.

Dialectical materialism: Marx adapted the Hegelian dialectic to argue that society is a reflection of economics. History progresses from agrarian communalism to slaveholding, feudalism, bourgeois commercialism, capitalism, socialism and, finally, to *communism* (a classless society in which the workers own the means of production and government is unnecessary). Marx saw this as an inevitable process, and that led him to believe more strongly in his predictions.

The chart and the explanation below it should help you understand Marx's theories on capitalism, communism, and the coming revolution.



Class Struggle: The *dominant class* in every society, whether they are slaveholders, feudal lords, or capitalists is a thesis with an antithesis, such as

slaves; serfs, or workers, respectively, who will overthrow the old order.

Inevitable Revolution: This is the result of the capitalists' increasing profits gained by lowering the workers' wages for labor to the point that the proletariat cannot afford to consume the products of manufacture *(surplus-value theory).* Economic depression occurs and lays hardship on the working class until it carries out a revolution. A *dictatorship of the proletariat* will establish a socialist government to wipe out capitalism.

Communism: The *"withering away o f the state"* will follow, whereby private property will cease to exist and economic exploitation will stop, ending crime, vice, and injustice; democracy will prevail on local level; *Utopia* (a perfect society) will result.

Anarchists, such as Mikhail Bakunin and Georges Sorel, asserted that all forms of governmental authority were unnecessary and should be overthrown and replaced with a society based on voluntary cooperation-and they went even further than Marx and Engels in their message about the corrupt nature of society.

The Technological Revolution *or* The Second Industrial Revolution

Around the last third of the nineteenth century, the application of science to industry brought about a radical change in the way Europeans lived. During the Second Industrial Revolution (c. 1870-1914), more areas of Europe experienced industrial activity, and industrial processes increased in scale and complexity.

- Industrial processes and activity increased in scale and complexity.
- Mechanization and the factory system became the predominant modes of production by 1914.
- *Mass production lowered the cost of goods and made them available to the general public; consumer goods became part of the mass market.*
- Smaller companies merged and consolidated until whole industries were dominated by *big business.*
- High wages in the cities caused a *population shift* from the countryside.
- Electricity and the internal combustion engine not only increased productivity but improved the quality of life.
- New industries emerged added to the new consumerism of the era:

    - The chemical industry
    - The electricity industry
    - Leisure travel, professional sports
    - The automobile industry
- New means of communication, such as the telegraph and telephone, changed business and culture.
- New forms of transportation changed everything from business to migration and marriage patterns.
- Increased consumerism changed leisure and home life including the spread of:
    - Advertising
    - Department Stores
    - Catalogs

Inventors of the Industrial Revolution

1708	Jethro *Tull's* mechanical seed drill made cultivation in rows widespread as it is more efficient and allows easier weeding.
1712	Thomas Newcomen built the first commercially successful steam engine. It kept deep coal mines clear of water. It was the first significant industrial of fossil fuels and marked first major power source invented since wind, water, and animal power were used.
1733	Kay invented the flying shuttle, which improved weaving significantly.
1761	James Brindley's Bridgewater Canal opened. Barges carried coal from Worsley to Manchester.
1765	James Hargreaves invented the spinning jenny: automating thread spinning for the first time.
1769	Arkwright's frame allowed much more efficient spinning of thread.
1775	James Watt created the first efficient steam engine with a condensing chamber.
1779	The first steam-powered mill used Crompton's "mule" and Hargreaves' and Arkwright's machines, fully automating the weaving process.
1787	Cartwright built a power loom.
1792	William Murdock (James Watt's assistant) lit his home with coal gas.
1793	Eli Whitney developed the cotton gin, increasing the efficiency of cotton as a source of raw material for textiles.
1801	Robert Trevithick demonstrated his steam locomotive.
1807	Robert Fulton built the *Clermont,* the first successful steamboat.
1826-42	Marc Brunei built the first underwater tunnel-under the Thames.
1830	The Liverpool and Manchester Railway began the first regular commercial

	rail service.
1831	Michael Faraday discovered electro-magnetic current, making possible generators and electric engines.
1834	Charles Babbage created the analytic engine, the first ancestor of the computer.
1837	Samuel R B. Morse developed the telegraph and Morse Code.
1838	Daguerre perfected the Daguerrotype, an early form of photography.
1849	Monier developed reinforced concrete.
1850	Gasoline refined for the first time.
1851	Singer invented the first practical sewing machine.
1854	Bessemer invented the steel converter, which revolutionized the production of steel.
1858	First Trans-Atlantic Cable completed. Cathode rays discovered.
1867	Alfred Nobel created dynamite, the first high explosive that can be safely handled.
1876	Alexander Graham Bell invented the telephone.
1877	Thomas Alva Edison invented the phonograph.
1879	Edison invented the incandescent lamp.
1883	The first skyscraper (ten stories) was built in Chicago and the Brooklyn Bridge opened; this large suspension bridge is a triumph of engineering.
1884	Maxim invented the machine gun, making possible mass slaughter and beginning the mechanization of warfare.
1885	Benz developed the first internal-combustion automobile engine.
1889	The Eiffel Tower created for the World Exposition in Paris.
1896	Marconi patented wireless telegraph.
1901	Marconi transmitted the first transatlantic radio message (from Cape Cod, Massachusetts).