Scientific Revolution, Enlightenment, and Mercantilism

Scientific Revolution

Assignment 1

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**Scientific Advance from Copernicus to Newton**

-the first few advances led to uncertainty

-overtime, scientific thought was seen as a model of the way to think

**Origins of the Scientific Revolution**

-model for scientific thought-the Greeks

 -physics-Aristotle

 -astronomy-Ptolemy

 -medicine-Galen

-the first and most dramatic discoveries were in these fields

-new observations proved the Greeks wrong

 -1600’s scientists preferred to make adjustments, not huge changes in the Greek theories

 -discovered other ancient Greeks who did not always agree with the most famous—Archimedes

*The Influence of “Magical” Beliefs*

 -“magic” seen as a serious intellectual enterprise

 -alchemy-idea that matter could be transformed using secret formulas

 -astrology-planetary movement could predict natural phenomena

 -Neo-Platonism-belief that truth about nature lay in essential but hidden forms

 -cabala-system of Jewish thought that the universe was built around magical arrangements of numbers

-Pythagoras-ancient Greek suggested numerical patterns could connect all nature

 -ideas were gaining followers

-an interest in new and simple solutions gave scientists the confidence to try new theories and get rid of old ones—paid more attention to math and started and intellectual revolution

*Observations, Experiments, and Instruments*

-2 other influences:

 -European fascination with technological innovation

 -growing interest in experimentation (medicine)

-inventions made more discovery possible in the 16th and 17th Century

 -telescope, vacuum pump, thermometer, barometer, and microscope

 -scientists could look at things not as they occurred in nature, but to reveal more information

**The Breakthroughs**

*Vesalius*

-work-*The Structure of the Human Body*

 -pointed out errors in Galan (the authority on the body since Ancient Greeks)

-opened a new era of observation and experimentation in the study of the body

*Copernicus*

-Polish priest

-work-*On the Revolutions of Heavenly Spheres*

 -Ptolemy’s calculations were too complex

 -the solar system was simpler—the sun at the center, the earth circled it

 -his calculations convinced many

-Pope Gregory XIII decided to reform the calendar in response-1582

 -use of the Julian calendar caused Easter to be later and later

 -we use the Gregorian calendar today

*Theories in Conflict*

-the scholarly community argued over Copernicus’s ideas

-leading astronomer Dane Tycho Brahe

 -plotted the path of the moon and planets for decades

 -came up with a compromise idea between Ptolemy and Copernicus

 -others were not ready to discard Galen

**Kepler and Galileo Address the Uncertainties**

-Johannes Kepler (1571-1630)-German

-Galileo Galilei –Italian

-both helped to resolve uncertainties about astronomy

*Kepler and the Laws of Planetary Motion*

-tried to prove the sun centered-heliocentric-theory of Copernicus

 -discovered three laws of planetary motion-published in 1609 and 1610

 -proved that planet’s orbits are ellipses—regular based on their distance from the sun which determines movements of all planets

 -few astronomers accepted it until Newton

*Galileo and a New Physics*

 -first to see a connection between motion of planets and motion on earth

 -reveled importance of physics to astronomy

 -approached his work as a modern scientist

 -built a telescope to observe the heavens

 -discovered and understood principle of inertia

 -used mathematical observation—a smooth ball on a smooth plain will keep moving- factors have to work to stop it (friction)

 -demonstrated only mathematical language could explain nature

*A New Astronomy*

 -1610 Galileo made the discovery (with a telescope) that Jupiter has satellites and the moon has mountains

 -calculated the height of the moon’s mountains and explained its light

 -Earth was only part of the universe

 -his theories could only be explained if the Earth was moving

*Conflict with the Church*

-Church was struggling with Protestantism—responded by trying to control all questionable views

 -Jesuit and Dominican astronomers upheld the Church’s views and referred Galileo to the Inquisition

*The Book and the Trial*

 -1616-Inquisition forbade Galileo from teaching his doctrine that the Earth moves

 -his friend was elected pope in 1623 so Galileo thought he was safe and wrote *Dialogue on the Two Great World Systems* in 1632 with approval (likely accidental) by the Church

 -wrote in Italian, not Latin in an effort to reach a wide audience

 -April 1633 brought before the Inquisition for defying the ban on teaching Copernicanism

 -abjured his beliefs that the Earth moved (to avoid excommunication)

 -remained under house arrest for years

 -1638 published *Two New Sciences* in tolerant Holland

*Assurance Spreads*

 -discoveries created a new certainty about the physical world

 -English doctor William Harvey provided a new understanding of the body and how blood circulates-function of the heart

**The Climax of the Scientific Revolution: Isaac Newton**

 -contributions in math, physics, astronomy, and optics

 -united physics and astronomy into one system to explain all motion

 -transformed math by developing calculus

 -established laws of modern physics

 -part of the Royal Society of London—prepared his best papers to prove his theories

 -other societies were established all over Europe to copy the Royal Society

 -in Copernicus’s time scientists worked alone

*The Principia*

 -Newton’s work the Mathematical Principles of Natural Philosophy (1687) aka the Principia

 -the last widely influential book written in Latin

 -Newton proved everything in the book with math and experiments

 -solved ancient questions about motion in 3 laws

 -without force, motion continues in a straight line

 -rate of change in motion is determined by forces acting on it

 -action and reaction between two bodies are equal and opposite

 -extended laws to the whole universe—govern planets and motion too

*The Influence of Newton*

 -his philosophy that the world was stable and orderly was as important as his discoveries

 -huge stature and importance

 -knighted in England

Scientific Revolution Assignment 2

Pg. 466-472

**The Effects of the Discoveries**

 -Scientist’s success of their reasoning encouraged new confidence in human powers

**A New Epistemology**

-Galileo stressed his discoveries were because of independent thinking

 -epistemology-theory of how a person obtains and verifies knowledge

 -stressed experience, reason, and doubt

 -rejected all unsubstantiated authority

 -new way to determine what was a physical reality

*Scientific Method*

 -process scientists said they followed after developing a hypothesis

 -observation

 -generalization based on observation

 -tests of generalization (experiments)

 -used only data from the observations

 -the language of science became math

**The Wider Influence of Scientific Thought**

 -scientists convinced the educated public that science offered truth in otherwise chaotic world

**Bacon and Descartes**

*Bacon’s View of Science*

-Francis Bacon-greatest science propagandist

 -described what science could accomplish for humanity

 -New Atlantis-described the ideal society

 -vision of science as the savior of the human race

 -government should sponsor projects to gather facts about the universe—will result in universal laws that will allow people to improve their lives

 -by mid-17th Century his ideas were mainstream

*Descartes and the Principle of Doubt*

 -Rene Descartes believed that all knowledge had to be observed and to avoid being deceived by your senses, must have doubt—refused to accept anything without verification

 -“I think therefore I am”—thinking verified his existence

 -felt our idea of perfection (since we are imperfect) proved the existence of God

*The Discourse on Method*

 -major work-*Discourse on Method of Rightly Conducting the Reason and Seeking the Truth in the Sciences* (1637)

 -thought is pure and unmistakable—people can only advance the understanding of the world by relying on its operations

 -Bacon and Galileo believed in faith and study of nature were separate—Descartes turned it into a wider principle

*The Influence of Descartes*

 -not only phenomenon of nature, but all truth had to be investigated according to the scientific method

 -contributions to research were theory, not experimental

 -distinction between mass and weight

 -algebraic notions and method applied to geometry and analytic geometry

 -emphasis on doubt undermined the idea of a hieratical universe

**Pascal’s Protest Against the New Science**

 -Blaise Pascal-French mathematician and experimenter

 -investigated math and games of chance

 -researched conic sections—resulted in integral calculus

 -discovered barometric pressure

 -invented a calculating machine

 -stopped researching math and devoted his life to saving his soul in 1654

*The Pensees*

 -the Reflections

 -written by Pascal

 -reveled his religious beliefs and a concern that science was becoming too influential

 -did not wanted to end research, wanted people to understand that what scientific research had revealed was limited

 -show how high the status of science had risen

**Science Institutionalized**

 -many felt that scientific information should be shared

 -scientific society in Rome was the first to do this formally

 -followed by France—Marian Mersenne started an international network of scientists

*The Royal Society*

 -located in Oxford during the English Civil War-1640s

 -formed the Invisible College—a group that exchanged information and discussed their work

 -included Robert Boyle-a chemist

 -in 1660 Boyle and 11 others formed the Royal Society of London for Improving Natural Knowledge

 -1662 it was granted a Royal Charter by Charles II

 -liked science with political authority

 -an indication of the growing presence of central government in all areas of society

 -the aim was to gather all knowledge about nature

 -served as a headquarters for research

 -1665-started *Philosophical Transactions*—first professional scientific journal

*Other Scientific Societies*

 -1666-French Royal Academy of Sciences established with the blessing of Louis XIV

 -Naples and Berlin had scientific societies by 1770

 -membership was limited and highly sought after

 -glamor attached to new fields

 -by 1660’s science became a model for all thought

*The Wider Appeal of Science*

 -people applied science to life

 -reverence for science came from the fact that the research answered old questions

 -order and harmony appeared in the work of artists and writers

**Arts and Literature**

 -old truths challenged and a new sense of assurance emerged

**Unsettling Art**

*Mannerism*

 -reaction against idealizing of the Renaissance

 -distorted human figures, unnatural colors, startling effects

*El Greco*

 -The Greek

 -trained in Italy, lived in Spain

 -used color, light, and elongated figures to make his distinctive

 -after 1600, painters rejected mannerists and the flight from reality

**Unsettling Writers**

*Michel Montaigne*

 -created the essay

 -inspired the search for self-knowledge

 -skepticism—preoccupation with uncertainty

 -felt nobody had to be an angel, being good was enough

*Neostoicism*

 -a more general approach to morality

 -calm acceptance of world and self-knowledge

 -Dutch writer-Justus Lipsius—urged kings to be restrained and self-disciplined

*Cervantes*

-Spanish writer

 -saw wide gaps between hopes and realities of his day—behavior, religion, social institution

 -wrote his satire-Don Quixote

 -pointed out brutality and lack of human values in society

*Shakespeare* 1564-1616

 -wrote on many topics

 -had to produce plays on short notice—used audience reaction to judge his work and make changes

 -his attitude toward his era important to history

 -shows legality and stability as a value-turbulent times in England

 -very patriotic

 -people are overtaken by events that they cannot control

 -nothing is consistent

Enlightenment

Assignment 1

556-566

**The Enlightenment**

 -built on the Scientific Revolution—belief that human behavior and institutions could be studied, ordered, and corrected

 -effort to make educated people more rational, tolerant, and virtuous

 -capital was Paris

**The Broadening Reverberations of Science**

*Popularization of Science*

 -processes of science applied to other areas of life

 -resulted in a skeptic attitude toward accepted dogmas

 -work of scientists translated into easy to understand reading—Newton and Descartes household names

 -Francois-Marie Arouet—Voltaire

 -studied Newton

 -felt liberal England gave Newton, Bacon, Locke, etc. the freedom to work

 -*Philosophical Letters on the English* (1734)-celebrated English toleration and attacked religious bigotry, censorship, and social snobbery of the French

 -chemistry-still could not explain fire

 -Joseph Priestly (English) isolated oxygen

 -Antoine Lavoisier (French)-analyzed air and water—tried to explain combustion

 -pseudo science started to appear

 -mesmerism—use of magnets and electricity to core ailments

*Natural History*

 -science of the earth’s development-zoology, geology, botany

 -easy for non-scientists to appreciate it

 -G.L. Buffon—keeper of the French Botanical Gardens

 -Natural History of the Earth (1749-1778)

 -theory of Earth’s development

 -used fossils

 -did not attack religious versions of creation

 -he did not believe in creation

 -hinted evolution was possible (did not use the word)

**Beyond Christianity**

 -one hallmark of the Enlightenment-erosion of the Bible as a source of revelation

 -scientists attempted to fit the new science into ideas about religion

 -focus on reverence for God and moral issues

 -thinking diminished the authority of religion in society

*Toleration*

 -French critic Pierre Bayle-*Critical and Historical Dictionary* (1697)-put religious teachings to the test of reason

 -critical of Christianity’s attempts to impose orthodoxy at any cost (Spanish Inquisition)

 -advocated complete toleration—any religion or none at all

 -moral behavior, not religion matters

 -Edict of Toleration—Hapsburg Emperor Joseph II-1781

 -allowed Protestants and Jews to worship freely and hold public office in the very Catholic Holy Roman Empire

 -attempted to reduce the influence of the Church by closing monasteries

 -used money confiscated from monasteries to support medical school at the University of Vienna

*Deism*

 -Voltaire was anti-Christian

 -his *The Philosophical Dictionary* was published anonymously and burned in many countries

 -more blunt then Bayle’s dictionary

 -argued that religious superstition bred fanaticism and resulted in bloody massacres like St. Bartholomew’s Day Massacre

 -hoped that educated people would abandon Christianity in favor of deism—belief that God created the earth, but after that he left it alone to function by natural laws

 -no divine intervention possible

 -no damnation or eternal salvation

 -to Voltaire, religion was a private matter

**The Philosophes**

 -a group of French intellectuals

 -saw themselves as leaders of the Enlightenment

 -came from aristocracy and the middle class

 -extended to other countries

*Intellectual Freedom*

 -shared a critical spirit

 -the idea that they had to test institutions of society with reason made many turn away from their faith

 -invoked the paganism of Ancient Rome—reason not religion ruled

 -Edward Gibbon-*The Decline and Fall of the Roman Empire* (1776-1788)

 -declared that Christianity had eclipsed a Roman civilization that tried to live according to reason rather than myth

 -also laid claim to Newton and modern scientists

*Persecution and Triumph*

 -philosophes had to fight against religious traditionalists and censorship all over Europe

 -lack of intellectual freedom

 -published work in secret and anonymously

 -some jailed or exiled

*Pioneering the Social Sciences*

 -some were historians—studied society, social institutions, and governments

 -sociology and psychology were started

 -based on studies proposed reforms to penal system and education

 -studied ethics with a utilitarian focus

*Political Liberty*

 -*Spirit of Laws* (1748)-Montesquieu-compared government and society

 -introduced prospective of relativism-analyzed institutions of government in relation to special customs, climate, religion, and commerce

 -argued that no single ideal government existed

 -admired the British system—felt that all could learn from it

 -Political liberty requires checks on those in power

 -liberty can only thrive with a separation of powers—executive, legislative, and judicial

*Liberal Economics*

 -believed in laissez- fair capitalism (Adam Smith)-government intervention put undue restraint on the economy

 -Physiocrats argued that economic progress depended on freeing agriculture and trade from restriction

 -believed that land was the only real source of wealth

 -wanted a uniform and fair land tax

 -wanted grain trade to operate on supply and demand

**Diderot and the Encyclopedia**

 -the Encyclopedia was produced by French philosophes—collection of knowledge on various subjects

 -Denis Diderot—published plays, novels, and critical essays on religion

 -wrote about the natural man

 -2 books were condemned as anti-religious, anti-state, and immoral

 -100 days in prison and a public apology 1749

*The Encyclopedia*

 -also known as-*Classified Dictionary of Sciences, Arts, and Occupations*

-was an inventory of all fields of knowledge

 -28 volumes

 -religion was carefully treated as philosophy and history-angered orthodox readers

 -science was at its core

 -against restrictions on trade and agriculture

 -endorsed absolute monarchy if it was efficient and just—concerned about civil rights, freedom of expression, and the rule of law

*The Encyclopedia’s Impact*

 -intellectually revolutionary

 -French government banned it after the first three volumes in 1759

 -Diderot published the rest underground

 -eventually published

**Jean-Jacques Rousseau**

-obsessed with the idea of moral freedom—found society very repressive

*Rousseau’s Moral Vision*

 -argued morality based in conscience, not reason

 -theme of his works of fiction—*Julie or the New Heloise* (1761) and *Emile or Treatise on Education* (1762)

*The Rebel as Cultural Hero*

 -fought with church and state—books were banned

 -disagreed with philosophes

 -by 1770s Voltaire and Diderot had become the establishment—Rousseau spoke for others

*Rousseau’s Concept of Freedom*

 -the *Social Contract* published in 1762-did not become famous until after the Revolution

 -meant to be a new standard to measure society

 -a government that distances itself from individuals over whom it claims authority is not valid

 -denied the idea that some people are meant to rule and some are meant to obey (an almost universal idea at the time)

 -ideally Rousseau felt individuals should have a role in making the laws they must obey

 -idea of the general will-individual interests are less important than general good

 -individual have to do what they ought, not what they want

 -freedom depends on a political framework involving consent and participation of the governed

Enlightenment

Assignment 2

Pg. 582-586

**Reform and Political Crisis**

-absolutist governments did not get far in granting rights and freedoms

**Enlightened Absolutism in Central and Eastern Europe**

 -concept of enlightened monarch invented by German historians critical of the French monarchy

 -argued that a strong enlightened ruler was the basis for progress

 -Kings who ruled in subject’s interests avoided violent conflict

 -Frederick II, they argued, symbolized enlightened monarchs

 -Enlightened Monarchs still tried to control their realm and expand territory

 -made changes to appear more enlightened

 -Catherine the Great (r1762-1796) Russia

 -convened the Legislative Commission—body of delegates invited to present grievances, propose reforms, and debate proposals

 -little came of it—she sent the delegates home

 -Charter of Nobility-strengthened nobility’s corporate status and increase their control over serfs in exchange for loyalty to the crown

*Conceptions of Enlightened Rule in Germany*

 -German writers saw the state as a machine and its ruler as its mainspring

 -success depended on the enlightened monarch and well trained officials

 -German universities trained bureaucrats

 -orders came from the monarch who was expected to focus on subject’s welfare

 -created a system of rule of law without a constitution or parliament

**Joseph II and the Limits of Absolutism**

 -Joseph II co-ruled the Hapsburg Empire with Maria Teresa

 -he became the sole ruler after 1780

 -promoted reform from above

 -maintained his Catholic faith—did not identify with philosophes

 -implemented several reforms—freedom of expression, religious toleration, control over the Catholic church and legal reform—all advocated by Enlightenment thinkers

 -ended torture and class differences in the application of laws

 -reduced royal censorship—Vienna became a center for literature

 -Edict on Religious Tolerance for Protestants and Jews

 -forced the Catholic Church to modernize (unpopular)

Agrarian Reform

 -attempted to change the economic and social position of peasants

 -attempt to eradicate serfdom and make Hapsburgs peasants into free people

 -eradicated personal servitude and gave peasants the right to marry and move

 -cancelled some of the old obligations and made taxes more fair

 -opposed by nobles, but he did not ask anyone’s opinion

 -later years-elevated the police to an imperial ministry and gave them more power

 -reinstated censorship

 -died in 1790-his successors reinstated serfdom

**Upheavals in the British Empire**

 -George III intent on advancing royal authority

 -used Parliament patronage and influence

 -Whigs saw him as a threat—enlisted support from outside Parliament

 -organizations called for political reform

 -laws against political corruption and greater freedom of the press

*Wilkes and Liberty*

 -John Wilkes-member of Parliament

 -attacked the Prime Minister and implicated the king over the terms of the Treaty of Paris 1763

 -arrested for libel-fled to France to avoid prison on porn charges

 -elected to Parliament three times-House of Commons refused to seat him

 -took his seat in 1774 after protests

 -Parliamentary reform supported by many who could not vote—wanted reform, not an overthrow of the system

*Rebellion in America*

 -George III and Parliament attempted to pass on the cost of colonial defense to the American colonies

 -increased taxes and centralized authority

 -rebel leaders appealed to the traditional rights of Englishmen

 -Declaration of Independence in 1776

 -lack of aristocracy in America allowed for rebellion (unlike Ireland or Netherlands)

 -created the most democratic government

 -not based on royal power

 -participation and consent of male citizens

Mercantilism

Assignment 1

Pg. 528-536

**Demographic and Economic Growth**

 -historical demographers—deal with migrations of existing populations

 -study birth and death rates, growth and decline of population

 -economic historians—analyze macroeconomic trends in production and prices

**A New Demographic Era**

 -population levels were constantly changing—cyclical

 -Europeans often struggled with subsistence

 -succession of poor harvests

 -undernourishment made people vulnerable to disease

*Population Growth*

 -by 1800, Europe’s population had grown by at least 50%

 -18th Century—steady (not cyclical) population growth

 -France became the most populated (except for Russia)

*Falling Death Rates*

 -death rates falling, not birth rates rising caused larger populations

 -improvements in medical science and hygiene

 -more stable food supply

 -Europeans remained extremely vulnerable to disease

 -tuberculosis, typhoid, malaria, dysentery, influenza, typhus, and smallpox

 -Except in England, birthrates in most of Europe did not increase in the 17th Century

 -later marriage—fewer babies

 -in England marriage age was down—more babies

**Profit Inflation: the Movement of Prices**

 -Europe’s wealth expanded in the 17th Century

 -gradual inflation dominated the time

 -reaction to growing population—needs more food, land, goods, and jobs

*The Impact of Inflation*

 -inflation was not the same everywhere

 -rents rose—shortage of land

 -real wages rose only slightly

 -drove poor people from countryside to city

 -merchants in cities could sell goods for more and pay workers less

**Proto-industrialization**

 -agriculture could not ensure economic growth in places with large populations

 -needy families could not earn a living

 -solution—domestic manufacturing—putting out system

 -merchants distributed raw materials (wool/flax) to households

 -men and women would spin and weave cloth

*Proto-industrialization*

 -name historians give to the economic development before the rise of factories

-amount of materials produced rose in the 17th Century—families devoted more time to production

-consequences:

 -people had more money—reinvest in production

 -increased demand for products and services

 -people were more comfortable with production and cash relationships

 -move to the cities

 -did not lead to more productivity or technology

**The New Shape of Industry**

 -manufacturing of cloth—huge change in England

 -major transformation depended on

 -development of more efficient tools and machines

 -development of new sources of energy

 -led to the reorganization of labor and the factory system

 -changes came from favorable conditions in England

 -legal system regulated property rights

 -efficient financial institutions

 -markets

 -growing consumer demand

 -free market doctrines of Adam Smith

**Toward a New Economy**

 -economists focused on performance an structure when analyzing economic systems

 -performance—measured by output—total or gross of a product produced per individual

 -best measure of the economy’s performance

 -industrial economics can see sustained growth in per capita production

 -structure—all characteristics that support or affect performance

 -economic, legal, political institutions

 -tax policies

 -technology

 -demographics

 -culture and ideology

 -technological innovation requires new inventions and the structure to support them

*Impediments to Economic Innovation*

 -small size of most European markets

 -markets cut off from each other

 -slowed the growth of manufacturing

 -limited the movement of capital and labor

 -skewed distribution of wealth hurt demand

 -luxury goods were produced in very small quantities

 -not much demand for other goods

 -question of property rights—encourage high rate of return on investment or impede it

 -guilds and government regulations impeded progress

 -governments allowed and created monopolies

 -cultural attitudes—aristocrats saw money that was made (new money) as tainted

*Adam Smith*

 -Scottish philosopher wrote—*An Inquiry into the Nature and Causes of the Wealth of Nations*

 -money did not constitute wealth—it was the marker of wealth

 -wealth came from the added value of manufactured items that came from a combination of wealth and labor

 -economic progress requires each individual be allowed to pursue his own self-interests without restriction by guilds, state, or traditions

 -natural division of labor should be encouraged at all levels

 -high tariffs, guild restrictions, and mercantilist restraints obstructed economic activity

 -Laissez-Faire—let individuals freely pursue their own economic interests

 -hands off approach

 -British business people and factory owners loved it

 -1786—free trade agreement between Britain and France—lowered protective tariffs

 -guilds started to disappear and lose influence—cotton textiles were outside of guild influence

**Roots of Economic Transformation in England**

 -England was the first to develop social structures that supported industrial growth

 -many advantages

 -fertile and productive land

 -balance of resources—coal, iron

 -streams to power mills

 -proximity to the sea—transport and access to markets

 -British built canals—2,600 miles by 1815

 -no internal tariffs

 -uniform money, weights, measures

 -common law

 -high standard of living—demand for goods

 -primogeniture—younger sons did not inherit land, had to fight work elsewhere

-Calvinists and Quakers (religious dissenters) could not find careers in government—turned to businesses

British Financial Management

 -lots of reinvestment is necessary for industrialization

 -depends on the skillful management of money

 -British had advantages:

 -growing banking system

 -confidence in paper money

 -Bank of England-established in 1694

 -responsible for management of British public debt—sold shares to the public to meet obligations, but was helped by the government

 -also lent money to the British government

 -France had no central bank

 -public borrowing drove up interest rates in the private sector

 -produced luxury items or very cheap goods

 -the British had more standardized products that were high quality

**Cotton: The Beginning of Industrialization**

 -18th Century—the demand for cheap goods was growing

 -slave labor made raw cotton cheaper than wool or linin

 -durable, washable, versatile

 -the putting out system had reached its limit—further merchants traveled to find workers the longer it took, harder to control products and workers

*Machines and Factories*

 -1730s invention of the fly shuttle allowed for the construction of larger and faster hand looms

 -traditional spinning methods slowed up the process—new spinning machines were invented

 -Richard Arkwright invented the water frame to twist cotton fibers into thread

 -put his machines in large factories and used water power

 -father of the factory system

 -James Watt perfected the steam engine

 -1785 Arkwright switched from water to steam power

 -result: lots of yarn that was slow to weave

 -1784—Edmund Cartwright designed the power loom, but it was not widely adopted until the 1800s

 -revolutionized the production of cloth—moved workers into factories where managers could watch their every move

Mercantilism

Assignment 2

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**Innovation and Trade in Agriculture**

 -1700 England-80% of English lived off agriculture, by 1800 it was only 40%

 -agriculture became much more productive

*Convertible Husbandry*

 -repeated harvests of the same crop on the same soil depleted the nutrients in the soil

 -could let the field lie fallow (don’t plan anything) every second or third year

 -use manure to replace the nitrogen-most peasants could not afford to fee the livestock necessary

 -peasants began to plant turnips to feed the livestock and which would provide the manure

 -Jethro Tull-British farmer and inventor

 -experimented with new farming techniques

 -caught on in England and became known as animal husbandry

*Improving Landlords*

 -innovative landlords did not let their land lay fallow-put it to use

 -tried to improve the soil

 -selectively bred animals to create new breeds, producing larger animals

**The Enclosure Movement in Britain**

 -the old way to manage land was the open field system-land was held in elongated strips open to all

 -had to follow the same routines of cultivation as their neighbors

 -decisions about the management of land were made by the village as a whole

 -kept the technology of cultivation stuck at that of the Middle Ages

 -Enclosing the farms was the only way to create compact farms and use the new methods

-in England-an Act of Parliament allowed large landowners to petition to enclose all the land in a village

-large land owners then could fence in the land and manage it how they wanted

 -Enclosing land was expensive, but worth the investment in the long run

 -from the 1750s on Parliament passed many acts allowing enclosures

*The Impact of Enclosure*

 -deprived the poor of their traditional rights to the common land and left them with small, unprofitable plots

 -most often they were forced to sell their land to large landowners and become urban workers

 -massive amounts of rural development happened in the wake of the enclosure movement

-led to the domination of rural society by the great landowners worked by tenant farmers who held long leases

-led to the disappearance of peasant type small farmers and pushed people to the city

-first urban, industrial economy

**Serfs and Peasants on the Continent**

 -little changed on the continent

 -in Eastern Europe, peasants were serfs

*Lords and Serfs in Eastern Europe*

 -nobles retained a near monopoly on the ownership of land—peasants were serfs

 -could not marry, move away, or trade without the lord’s permission

 -ensured that peasants would be available to provide labor that the lord needed

 -in return, serfs received access to plots of land (they did not own them)

 -much of their time was spent doing unpaid work for their lord

 -hours/days based on tradition, not law

 -conditions varied across Eastern Europe

 -Polish and Russian serfs were pretty much slaves

 -the Russian government owned many serfs, and sent them to work in mines and factories

 -in Prussia and the Hapsburg Empire, serfs had some rights

*Lords and Peasants in Western Europe*

 -serfdom in most places was gone

 -peasants were free to buy land if they could afford it—not enough land, and most could not afford it

-most peasants lived under a system of seigneurialism-peasants owed their lords various dues and obligations on their land (even if the peasants owned it)

 -fees and charges (percent of crops) a source of income for the lord, and a burden for the peasant

 -lords administered justice in criminal and civil matters and had exclusive hunting rights

 -lords also owned and profited from wine presses, flour mills, and bread ovens in most cases

 -Peasants did not tend to experiment with new farming methods

-Peasants had many obligations—royal taxes, rents, seigniorial dues, tithe to the local church, and interest payments on their debts

 -relied on tradition and custom

*Peasant Survival Strategies*

 -Peasants had to control enough land to meet obligations and feed themselves

 -often peasants owned some land and rented what else they needed

 -peasants did not like to see the consolidation of small plots into large farms

 -peasants resorted to stealing, poaching, begging, selling their labor, and avoiding taxes to get buy

*The Family Economy*

-women worked in the home—cooking, cleaning, repairing clothing, spinning yarn, and maintaining the hens and chickens and small garden

-men’s work was to care for large animals, plow, and plant

-at harvest time the whole family worked in the field

*The Limits of Agrarian Change on the Continent*

-change came more slowly on the continent then in England-in some places high food prices encourage new farming methods

Mercantilism

Assignment 3

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**Eighteenth Century Empires**

 -colonial trade became another driver of economic growth in Britain and France

 -plantation economies, reliant on slave labor, provided cotton, sugar, and tobacco

 -trading empires were protected by the armies and navies of Britain and France

**Mercantile and Naval Competition**

-after 1715 the Dutch, Portuguese, and Spain were focused on defending their empires, leaving further expansion to the English and the French

*The Decline of the Dutch*

 -the United Provinces (aka Dutch Netherlands) had declined in power after the Wars of Louis XIV

 -suffered from demographic and political stagnation

-the Dutch economy declined when the British and French both decided to eliminate them as middle men for trade

-high taxes on manufactured goods and high wages in the Netherlands made Dutch goods expensive

-Dutch financial systems kept the Netherlands from being insignificant in Europe’s economy

 -shifted away from trading to credit and finance

 -first to perfect paper money, stock market, and central bank

 -lent money to private bowers and governments

*The British and French Commercial Empires*

 -Britain’s only competitor was the France-the only country to maintain a large army and navy

 -rivalry took place in four regions-West Indies (sugar producing islands)

 -Slave producing West Africa

 -North America

 -India and other parts of Asia-through powerful trading companies

-the French absolutism fostered a centralized control, while British colonies were more independent from each other

-British colonies were controlled by the crown and Parliament, but also have local assemblies and developed systems of self-government

-both applied mercantilist principles to their colonial trade and created large navies to protect the trade

*Mercantilism*

-mercantilism supported regulation of trade by the state in order to increase the state’s power over other states

 -all economic activities of the subjects less important than the needs of the state

 -practiced in Britain, France, Prussia, and elsewhere

 -advocated a favorable balance of trade measured by the inflow of gold and silver

 -assumed that a country’s share of gold/silver can only increase at the expense of other countries

 -idea attacked by Adam Smith in 1776

-Colonies could promote a favorable balance of trade by producing raw materials and staple crops for the parent company and by buying the manufactured goods from the mother country

-other countries were to be excluded as much as possible

 -countries used taxes, regulations, and prohibitions to exclude other countries

-most of the parties involved became wealthy

-seaborne empires had to be protected—rivals excluded, regulation enforced

 -navies were improved and expanded

 -required safe ports

**The Profits of Global Commerce**

 -colonial markets increased trade tremendously

-West Indies seemed to be ideal colonies-produced sugar, tobacco, indigo, and cotton while did not produce other things and were dependent on manufactured goods from Europe

*Triangular Trade*

 -Triangular Trade-trade between the home country and two overseas areas

 -many patterns existed

 -colonial economies to help mother country (mercantilism)

**Slavery, the Foundation of Empire**

 -global trade relied on slavery

 -at its height about 88,000 Africans were brought to North America every year

 -trading slaves was lucrative and dangerous

 -demand was high, and continued to rise

*The Ordeal of Enslavement*

 -slaves came from the interior of Africa, using African middlemen

 -many slaves died before they left Africa or en-route to the Caribbean in the Middle Passage

 -after the 1780s, there were fewer slave ships across the Middle Passage

**Mounting Colonial Conflict**

 -population of Britain’s North American colonies was growing

 -cities were growing

 -population was spreading west

 -French settlers were spread thinly over their holdings

*Conflict on the Frontier*

 -France establish forts in the Great Lakes region

 -France worried that the British would penetrate the Ohio Valley

 -British settlers worried the French would cut off their westward expansion

 -both sides wanted the American Indians on their side

 -1745 started years of unofficial hostility

 -Britain took on the expense of their colony’s defense

 -in May 1756, Britain and France officially declared war

**The Great War for Empire**

 -in Europe called the Seven Years War

 -centered on the rivalry between Austria and Prussia, but included Russia, France and Britain

 -also a fight for North America between Britain and France—French and Indian War

 -started out in a string of defeats for the British

 -there were too few French to maintain their victories

 -even naval matchup of the 1740s became British superiority in the 1750s

*Pitts Strategy*

 -William Pitt became British Prime Minister in 1758-the war was about to turn

 -honored the British commitment to Prussia, but placed high priority on defeating the French

 -French prepared to invade the British Isles, but were defeated in naval battles in 1759

 -after that the British ruled the seas

 -with a depleted navy, France could not transport troops and supplies to the colonies

 -the British defeated the French at the Battle of Quebec

*The Treaty of Paris*

 -war weary Britain did not insist on keeping all of its conquests-gave back several Caribbean Islands

 -British held on to Canada (which kept the North American colonies loyal to the British)

 -French troops were also excluded from India-proved to be very important

**The British Foothold in India**

*A Decaying Empire*

 -by the mid-1700s, the Indian Mughal Empire was in decline

 -ethnic strife, dynastic instability, factionalism, greed, incompetence of rulers

 -little to do with Europeans

 -British and French merchants had prospered on the coasts

 -Britain administered its interests in India through the East India Company-a private corporation

 -at first neither the British or the French tried to establish colonies in India

-as their competition intensified, both the British and the French began to try to maneuver with force and diplomacy among the native groups

*From Trade to Conquest*

-Robert Clive commanded an army of Indian soldiers working for the British (Sepoys) to oust the French and suppress native opposition to the British

-defeated his opposition at the Battle of Plassey

-British East India Company had unchecked power and no responsibility

 -collected taxes, controlled trade, and increased military control

-British men (like Clive) that arrived in India poor, returned to England wealthy

-by 1764 the British had ousted the French from any influence

-Parliament passed the India Act of 1784 which replaced the British East India Company with the British government as the authority in India

 -first governor general of India-Lord Cornwallis (surrendered to the Americans at Yorktown)

*The British Raj*

 -British rule in India was called the Raj

 -to create a class loyal to the Raj Cornwallis turned the rural gentry into landlords-could evict peasants

 -highest positions reserved for whites

 -British held a monopoly on salt and opium

-salt monopoly extracted money from the Indians

-opium was shipped to China in exchange for tea