

Modern World History: Notes: Origin of Liberalism

The French Revolution was a transforming event that had profound effects on Europe and the rest of the world. While the causes of the French Revolution can be traced back to the systems of government and traditions that arose in France during the Middle Ages, the conflict that exploded in the French Revolution was the result of three primary events. First, there was the development of France into an Absolute Monarchy in which the monarch of France had become too powerful, and could crush all efforts to modernize French society, and too opulent for France to support. Second, in the English Civil War and the Glorious Revolution, England overthrew its monarch and established a parliamentary government that used laws to limit the power of its king. And third, in the Enlightenment, European scientists and philosophers began to develop new ideas and theories based on logic and study of the natural world that challenged the legitimacy of the traditional powers of Europe and offered new ways to organize society.

Constitutional Monarchy & Absolute Monarchy

Monarchy, rule by kings, is one of the oldest forms of governments in the world. During this period of history, two different forms of monarchy appeared in Europe. In England, constitutional monarchy, where written laws limit the power of the king, came into existence. In France, the king was able to control all political power and become an absolute monarchy.

Louis XIV (1643 – 1715) – The Sun King

Louis XIV was four years old when he became King of France. While he was technically king, he did not exercise any real power. Still, the conditions that would cause Louis to become an absolute monarch were coming together. First, political power was becoming centralized in the position of king. While Louis was a child, the power to govern France was exercised by an appointed regent, Cardinal Mazarin. Mazarin, similar to regents for earlier kings, weakened the ability of the nobles to challenge the king. The reason for this was to prevent a civil war between the nobility in France. Louis' grandfather, Henry of Navarre, had become king by winning a vicious civil war in France fought over religion. He was only able to win by compromising his own religion, and shortly after becoming king, he was assassinated by a religious fanatic. After that, the regent who ruled with Louis' father, weakened the ability of the nobles to militarily resist the king. By the time Louis took the throne, political power was becoming concentrated in the hands of the king.



A second event that convinced the young Louis to take absolute power was a rebellion in Paris called the Fronde. While the rebellion was easily crushed, it convinced Louis to move his government out of Paris to avoid the potential danger of a rebellion in the city.

At age 23, when his regent Cardinal Mazarin died, Louis XIV took his full power as King of France, the most powerful country in Europe. An indication of the power of France can be shown by a comparison of the populations of the major Western European countries in 1660.

	France	England	Netherlands
Population	20 million	5 million	2 million

For 54 years, Louis XIV did more than rule over France, he dominated it. Louis was called the Sun King not only because he used the sun as his symbol, but because he viewed that France depended on him the way the earth depended on the sun. Louis acted as the center of France directing and controlling the lives of his subjects, often with complete disregard for their own wishes. He described his view of his powers in governing France when he said,

“L’etat, c’est moi” – “I am the state” – Louis XIV

Louis XIV was able to directly control the workings of his government through the administrative organization of his government. An important point of his administration was that he appointed Intendants or royal agents from the middle class to govern the provinces of France according to his commands. Unlike nobles who inherited their positions, the Intendants were selected for their ability, experience and loyalty. Since the Intendants were loyal to Louis XIV for their position, they worked to strengthen the power of the king. As a result of this policy, the French nobles lost political power.

Louis XIV power was based on the wealth that he had at his disposal. Louis had his Minister of Finance Jean Baptiste Colbert strengthen the French economy in order to finance his government. Colbert believed in the idea of Mercantilism. Mercantilism held that the wealth of a country was tied to the amount of gold and silver it possessed. Therefore, to become wealthy, a nation had to increase its holdings of precious metals (gold & silver) through trade. Basically a country should export more to other countries than it imports from those countries. If a country did this, it would have more gold and be wealthier. This money could be used to increase the power and prestige of the country.

Colbert had two goals as a mercantilist: increase royal power and the economic strength of France. He believed that these ideas were connected. If France became wealthier, than its people would pay more taxes to the king and the king would have more money to increase the power of the country, through increasing the size of the army. Colbert did three things to make his plan a reality:

- He used gave merchants tax breaks to promote industries and build roads and canals to increase trade within France. He also paid manufacturers of goods, such as glass, metal and cloth, in other parts of Europe to relocate to France. He also increased the tax for importing good into France, which discouraged imports into France. As a result, France could produce everything it needed, and export the rest to other countries.
- He improved tax collection. He introduced the practice of “tax farming” where private companies paid the government for the right to collect taxes in different regions of the country. As a result, the governments received the money from the companies, which could then keep any “extra” taxes collected for themselves. This meant the government did not have to pay to collect taxes. It also meant that 25% of the taxes paid never went to the government.
- He raised taxes. Over the course of Louis XIV’s reign, taxes doubled.

Despite the increase in taxes, the French economy grew more prosperous and as a result, as Colbert planned, Louis XIV had more money that he used to increase his power and glory. Principally, Louis XIV did two things with his money.

First he built the Place of Versailles twelve miles outside of Paris to represent the glory and power of his reign. The palace took 35,000 workers 27 years to build. The place building was over half a mile long and had over 20,000 acres of gardens. Versailles was center of Louis’ government and he required the nobles of France to live at Versailles as a way of reducing the nobles’ power. The nobles formed the core of Louis’ court, or the people who surrounded the king and were rewarded by him. There were over 1000 nobles and 9000 servants living at Versailles. In order for nobles to win Louis’ favor, they needed to compete against the other nobles for his attention. Louis encouraged this competition knowing that if the nobles spent their time at Versailles fighting each other, they could not work together to plot against him. In addition, while at Versailles, the nobles could not build a power base in the French countryside.

However, the nobles willingly supported Louis’ court life because Louis spent extravagant amounts of money to make Versailles the cultural center of Europe. In the social life of the French nobility, Louis’ court at Versailles was the only “place to be.” He financially supported the best artists, musicians and writers to make his court a sophisticated, luxurious and splendorous environment, which was envied and emulated by European monarchs for generations.

Second, Louis fought wars in an attempt to spread his power. For 30 of the 54 years that he ruled France, France was at war. Louis was able to use his power, and government administration to build a large national army that he had direct control over. Louis built an army of 400,000 professional soldiers, the largest army in Europe, to increase the size and power of France. He fought wars against Netherlands, Sweden, England, Spain, and the Holy Roman Empire. His most costly war was the War of the Spanish Succession where the other countries of Europe used a Balance of Power Strategy to defeat France. The smaller countries formed alliances to “balance” the greater power of France. In this way, France was unable to use its greater military power to secure any significant victories.

As King of France, Louis wanted to unify the French people under his rule. Louis, as a Catholic monarch, was disturbed that the Huguenots, French Calvinists, were able to practice their faith under the Edict of Nantes (Issued by his grandfather Henry IV to end the wars of religion in France). In 1685, Louis revoked the Edict of Nantes and suppressed the Huguenots – they could not practice their religion or hold public office. Hundreds of thousands of Huguenots, representing the middle class of merchants and craftsmen, fled France to the protestant countries of England, the Netherlands and the kingdoms of Germany. Ultimately, the loss of this skilled and productive population hurt the economy of France and strengthened the economies of France’s enemies.

Unfortunately for France, Louis XIV’s reign was a burst of glory that set the stage for future problems. First, the cost of his wars exhausted the French treasury and left the country dangerously in debt. It was estimated that the government was spending three times the amount it collected in taxes. In addition, it is estimated that up to 20% of the population died as a result of Louis’ wars. Second, his economic policies impoverished many middle and lower class French citizens. Third by forcing the nobles to live at Versailles, the nobles became “absentee landlords” who cared little for the people who lived on their lands. As a result, the king became less aware of the suffering and poverty in France. All of three things would later cause the French Revolution. When Louis died in 1715, he advised his great-grandson, “Do not imitate me in my taste for building, nor in my love of war. Strive, on the contrary, to live in peace with your neighbors... Make it your endeavor to ease the burden on the people, which, I, unhappily, have not been able to do.”

The English Civil War (1642 – 1646)

Together, the English Civil War and the Glorious Revolutions, was the first “democratic” revolution in the modern world. The results of the English Civil War had a strong effect on the American Revolution a little over a century later. There is a difference between a civil war and a revolution. A civil war is a violent political struggle between political groups within a country for political control of the country. A revolution is a political struggle that results in the formation of a new type or system of government.

The roots of the English Civil War go back to 1215, when King John signed the Magna Carta (Great Charter), which later led to the establishment of Parliament. Parliament was a meeting of the king, nobles, and commoner to “parley” or talk about the government. The tradition of Parliament led to the idea of “limited monarchy”, in which that the combination of law and Parliament limited the power of the king and that common people were guaranteed basic legal rights. Limited monarchy made England different from other European countries where the monarchs had absolute power. The major power that Parliament held over the king was the power to set and collect taxes. However, the power of Parliament was quite small compared to the power of the king, and often a strong king was able to ignore Parliament altogether.

In 1534, during a European wide conflict known as the Protestant Reformation, the power of the king expanded under Henry VIII who created an imperial monarchy by making the king both the political and religious leader of England, when he broke away from the Roman Catholic Church and created the Church of England. The imperial monarch was a double-edged sword because it increased the power of the king, but it also made any religious dispute a political dispute. After the creation of the Church of England, the English population was divided over beliefs and practices of the Church. Some wanted to maintain the structure and ritual of the Catholic Church, while others wanted to adopt the practices and beliefs of the radical Protestant churches, such as the Calvinists. After the death of Henry VIII, the three next monarchs (all his children) adopted different religious practices and used the power of the monarchy to destroy anyone who openly advocated different religious practices or beliefs as heretics. The result was that the beliefs and rituals of the Church of England were undefined and a source of conflict in English politics.

The English Parliament was divided into two houses. First there was the House of Lords, that represented the nobility. The second was the House of Commons that represented the middle-class (townspeople and merchants). After the Protestant Reformation, Puritans, extreme Protestants that wanted to rid the Church of England of any Catholic influences, came to dominate the House of Commons. This dispute over the form of the Church of England became a political issue because the king was the head of the Church of England. This meant that questioning the religious power of the king could be seen as treason, since it called into question the king’s political power.

After the death of Elizabeth I, James I, son of Mary Stuart, became King of England. James I, a Catholic, believed in the “Divine Right of Kings” that said the king’s right to rule and the power of kings came from God, not Parliament. As a king, James ignored Parliament. In addition, since he was the king of both England and Scotland, he united the two crowns making it one kingdom. Under James’ direction, the Union Jack became the flag of Britain.



Following the death of James I, his son, Charles I became king. Charles I also believed in the Divine Right of Kings and did not accept the power of Parliament. However, in return for the right to raise taxes for the army, Parliament forced Charles I to sign the Petition of Right, which forced Charles I to recognize Parliament’s power.

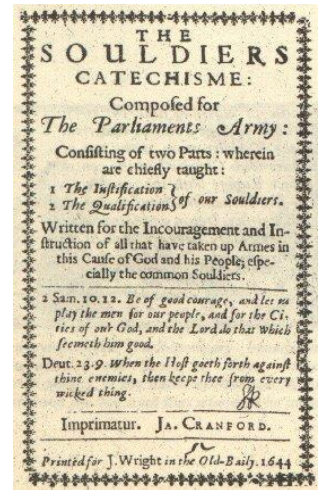
It was the combination of religion and taxes that caused the English Civil War. The trouble began in 1633 when Charles I made William Laud the Archbishop of Canterbury, the highest religious figure in the Church of England. Laud was opposed to the Puritans, who wanted to “purify” the Church of England of Catholic influences. Laud used his position to drive Puritans out of the Church of England and, if possible, England. This led to the growth of Puritan colonization of New England. Laud’s actions sparked a rebellion by Calvinists in Scotland. In order to deal with this, Charles I asked Parliament to raise taxes to pay for the army to put down the rebellion. Puritans in the House of Commons, rather than help the King attack fellow Protestants, passed laws to weaken the power of the King and strengthen Parliament.

The Civil War began in 1642, when Charles I tried to shut down Parliament with the force of arms because Parliament had demanded that Charles I surrender nearly all of his power to Parliament. Charles, supported by a detachment of soldiers stormed into Parliament to arrest the members of Parliament who were acting against him. However, they had already fled and the use of military power against Parliament turned London against the Charles. Charles, left London and moved to Oxford, where he raised an army and declared war on Parliament. This act started the civil war. For the next four years, the forces of the King fought Parliament for control of England. On the surface this was a religious struggle between Anglicans and Puritans. However, this civil war was also a struggle between the nobility and the middle class. The nobility represented the landed aristocracy and had their strongholds in the north and west of England. The middle class represented the prosperous towns and cities of the southeast including London, the capital. However, large parts of England, including families, were divided between the two sides, and many wanted nothing to do with the war. Edward Hyde, a witness who wrote a history of the Civil War said, “the number of those who desired to sit still was greater than the number of those who desired to engage.” In general, the two sides divided on the following lines:

- Supporters of Parliament were called “Roundheads”. This is because the soldiers in Parliament’s army cut their hair into a bowl cut. They claimed they were fighting for “God and Parliament”.
- Supporters of Charles I were called “Cavaliers”. They were named after the Spanish cavalry, called caballeros or “noble horsemen”, who fought against the Protestants in the Netherlands. They said they were fighting for “King and Country”.

During the first two years of the war, the Charles won most of the battles because the nobles had an advantage based their traditional military upbringing. However, after 1644, the war started to turn in favor of Parliament because of the leadership of Oliver Cromwell. Cromwell organized and led an army of middle-class Puritans called the New Model Army that trained and was disciplined similarly to modern armies. For example, the New Model Army practiced organized drills, promoted its officers based on merit (rather than noble title) and wore standard uniforms. These practices gave the New Model Army the advantage in the drawn out conflict of the Civil War. In 1646, after being militarily defeated, Charles I surrendered to Parliament. Ironically, the success of the New Model Army not only ended the power of Charles I, but also the power of Parliament.

The capture of Charles I created a division within Parliament and between Parliament and the New Model Army. The majority of Parliament wanted to work with Charles I to create a constitutional monarchy, in which a written constitution would limit the king's power. However, Cromwell and his followers wanted to abolish the monarchy. In addition, Parliament passed a series of laws that made disagreement with the doctrine of the Church of England a crime that was punishable by death. Many of soldiers in the New Model Army belonged to radical Protestant sects that disagreed with the Church of England. Charles I refused to accept a constitutional monarchy because he believed he could use the division between Parliament and the New Model Army to his advantage. Instead, Cromwell used his power over the New Model Army to force the end of both the monarchy and Parliament. This conflict led to a second civil war that resulted in Cromwell's complete victory. After this conflict, 96 members of Parliament, the majority of Parliament, which were opposed to the New Model Army were arrested and removed from office. The remaining sixty members, called the "Rump Parliament", continued to rule England, but was under the control of the New Model Army. In essence, England became a "Puritan Republic".



In January 1649, Cromwell and Parliament put Charles I on trial for treason. The charge of treason was based on the concept that Charles I had broken the law by fighting against Parliament. Since he believed in Divine Right of Kings, Charles I refused to recognize the right of Parliament to put him on trial and did not defend himself against the charges of treason. At the end of the trial, Charles I was found guilty and was executed. This was the first time in history that a monarch was put on trial and publicly executed. Most people in England opposed the execution, but could do little in the face of the power of the New Model Army.



In response to the execution, Scotland and Ireland revolted in support of Charles I's son, Charles II, and his claim to the throne. In 1649, Cromwell conducted a brutal invasion of Ireland to crush the rebellion and in the process he destroyed Catholic power in Ireland. He confiscated 70 % of Irish lands and gave them to his supporters and soldiers. Up to one-third of the Irish people died as a result of Cromwell's actions. As for Scotland, Cromwell waited until the Scots crowned Charles II king and then defeated him in battle. Charles II fled Scotland to the protection of Catholic France.

In 1653, Cromwell closed Parliament and ruled England as "Lord Protector" (a dictator) until his death in 1658. In order to control England, Cromwell divided it into 11 military districts, each under the control of a military general. Despite military rule, England was a chaotic place in which the general population chafed under the Puritan laws closing theaters, and banning dancing and gambling.

The Restoration of the Monarchy – 1660

Following the death of Oliver Cromwell, the Lord Protector, England found itself leaderless. As a dictator, Cromwell had closed Parliament, thereby closing any way for a new leader to emerge. More to the point, the proven inability of Parliament to rule following the Civil War caused many to question the wisdom of Parliamentary power. As a result, after his Cromwell's death, England had to return to its traditional leaders of monarchs.

In 1660, Charles II, son of Charles I, returned to England and was crowned king. Not wanting to end up like his father, Charles II did not claim the "Divine Right of Kings". He accepted Parliament's power, the Magna Carta, and the Petition of Right. In

general, Charles II enjoyed all the privileges of being king, but did not want to be bothered with any of the responsibilities. As a result, Parliament was able to increase its power.

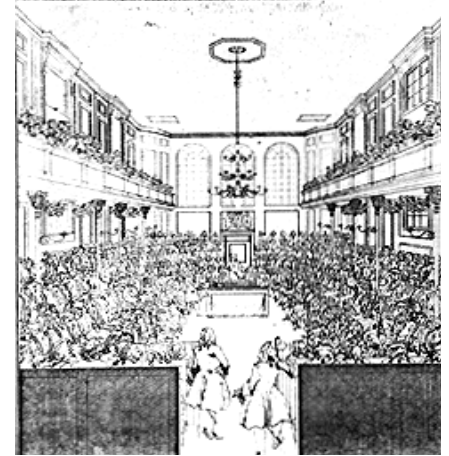
Under Charles II, Parliament passed the Habeas Corpus Act (1679) that said a person could only be put and kept in jail by the order of a judge, not the king. This limited the power of the king to use arrest to silence political opponents. Historically, British kings had ordered those who opposed them to be arrested and held in the Tower of London. Habeas Corpus also gave people the right to trial and protection from being tried twice for the same crime (double jeopardy).

However, there was still the problem of religion. While he was officially Protestant, Charles II wanted to be Catholic, and he converted to Catholicism shortly before his death. Still, Protestants opposed Catholics and religious toleration controlled Parliament. In 1673, Parliament passed the Test Act that allowed only Protestants to hold public office. Again, this limited the powers of the King to appoint people to positions in the government.

The Glorious Revolution

When Charles II died without a son in 1685, his brother, James II, who believed in the “Divine Right of Kings” became the king of England. This created a division within Parliament that formed the beginning of political parties in England. Political parties are formed when representatives with similar political views organize themselves into a voting block which allows them to turn their political ideas into government policy. In British Parliament, the party that controls the majority of votes controls the government. These basic parties would form the basis for later political parties in the United States. Both parties developed names based on the insults from their political opponents.

- Supporters of James II were called “Tories” (Irish Bandits), because they supported a Catholic king and wanted to violate the “law” of Parliament’s power.
- Opponents of James II were called “Whigs” (“Assassins” in Scotch), because they were radical Protestants that supported the principle of killing kings, in particular, the execution of Charles I.



As a king, James II did three things that challenged Parliament and set the stage for a second revolt against the monarchy:

- James II ended the Test Act and said that both Protestants and Catholics could hold public office. This demonstrated James contempt for Parliament and established law.
- James II stationed an army outside of London. This alarmed Parliament since James II might use the army to attack and close Parliament.
- James II and his second wife, a Catholic, had a son. This established that monarchy might continue for generations as Catholic.

To overthrow James II, Parliament, both Whigs and Tories, invited James II’s daughter, Mary, and her husband, William of Orange of the Netherlands, to become the new Queen and King of England. From Parliament’s perspective, William and Mary were ideal candidates for king and queens because they were Protestant, from a country with religious tolerance, and a country that had an elected government.

In November 1688, William and Mary, with their army, left the Netherlands and landed in England. Without a fight, James II fled to France. This bloodless revolution is called the Glorious Revolution because it changed the political power structure in England. From this point on, Parliament was the supreme power in England. The power of the king would be subservient to Parliament.

In 1689, the power of Parliament was codified in law when William and Mary became King and Queen of England. William and Mary agreed to the Bill of Rights written by Parliament. The Bill of Rights limited the power of the king for imposing taxes, restricting the power of Parliament, maintaining an army in peacetime, and interfering with the freedom of speech. The Bill of Rights was an important milestone in the idea of “rule of law”, or the idea that governing authority resides in written law and not a political figure, such as the monarch.

Right to Revolution?

After the English Civil War and the Glorious Revolution, political philosophers began to debate whether people had the right to overthrow their leaders, as Parliament had done in both the English Civil War and the Glorious Revolution.

In 1651, Two years after the execution of Charles I, Thomas Hobbes wrote his book the Leviathan, stating that people did not have the right to rebel



against the government. A leviathan is a large sea monster. Hobbes' title was to equate the power of a king to that of a large sea monster. The idea was that the government should have overwhelming power over the people. Hobbes, who had witnessed the horrors of the English Civil War, thought this was a good thing!

Hobbes believed that by their nature, people were wicked and evil. Hobbes said that life in a state of nature, which was defined as life in the absence of government, was "nasty, brutish, and short". Hobbes argued that without the force of government to protect man from his wicked self, man would be caught in a constant war with all other men. However, Hobbes also believed that man was rational, and this rationality would lead man to the realization that it was better to surrender his freedom to a government in return for protection from the state of nature. Hobbes argued that man formed a "social contract" with the government that gave the government absolute power in return for protection.

Hobbes believed that because of the wicked nature of man, life under any government, no matter how bad, was better than life without a government. If people overthrew their government they did not have the ability to form a new government and would languish in the state of nature. Therefore, in order for a government to have the power necessary to prevent the horrors of social disorder, government needs to have absolute power over its people. The awesome power of government was comparable to a Leviathan.

John Locke took the other side of the argument. Locke believed that people were rational and had the ability to govern themselves. In his book Treatises on Government, Lock argued that rational people in a state of nature formed governments to protect their "life, liberty, and property". Locke considered peoples' life, liberty, and property, to be "natural rights". Locke considered everyone to be in possession of natural rights. According to Locke, these were rights that people brought with them from the "state of nature" into society, and that no government had the rightful power to take away these rights. Further, he argued that the primary goal people have in joining a society was to protect their natural rights.

Locke reasoned that in forming a government, people created a "social contract" with the government, based on the premise that the government would protect their natural rights. If a government failed to protect or violated people's natural rights, people then had the right to revolt and replace the government. Locke held that rational self-interested individuals have the ability to form their own government, and therefore have the ability to replace a bad and abusive government with a good one. In essence, if the government violates the social contract, people are justified in replacing the government and forming a new social contract. Locke's ideas established the concept of civil society, where people can form their own associations to affect the government.

Locke's social contract established the philosophical ideal of a government based on the rule of law. It was through written laws, or a constitution, that people outlined the powers they give the government. This justified Parliament's actions in both the English Civil War and the Glorious Revolution.

Locke's ideas justified the actions of Parliament towards Charles I in the English Civil War and James II in the Glorious Revolution. Ironically, less than a century later Thomas Jefferson used Locke's ideas in the Declaration of Independence to legitimize America's break from Parliament and England. In contrast, Hobbes ideas on Absolutism were the dominant practice in France and most of the rest of Europe.

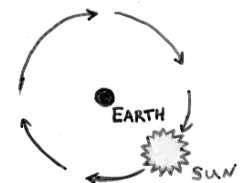
Scientific Revolution & The Enlightenment

The complex systems that are used to organize, coordinate, and improve the modern world are based on rational thought. This faith in rationality arose from the ability of scientific thought to explain the world. Scientific thought, based on the view of a rational universe that can be understood by the human mind, is at the core of the belief that rational thought can be used to improve human society. The intellectual development of the Scientific Revolution and the Enlightenment gave birth to the ideals that would drive the American and French Revolutions and continue to shape the modern world.

Shape of the Solar System

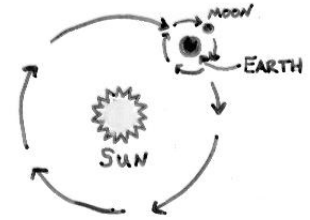
Beginning in the 1400's, European thinkers began to examine the natural world in greater detail with the goal of developing an understanding of the forces that formed and guide the physical world. These early scientists categorized plants and animals and dissected them to see how they worked. They studied the composition of the earth and the forces that acted on the earth. It was through this process, called the Scientific Revolution, which was based on examination of natural phenomena and developing rational thought, that modern science was created. The process of discovering the place of the earth in the universe describes the processes developed by the Scientific Revolution.

Prior to the Scientific Revolution, educated Europeans believed scientific ideas developed by the Ancient Greeks. The ancient Greek philosophers Aristotle and Ptolemy, using a combination of observation and logic, taught that the earth was round and that the solar system was geocentric or earth centered with the sun revolving around the earth.



The Catholic Church adopted this view and used it as a way of justifying the importance of mankind in God's creation. Science was used to reinforce religious. According to the Church, angels moved all of the planets and stars on perfect crystal spheres that surrounded the earth. This was believed to be the "gospel truth" and to question it was to question God and the Church.

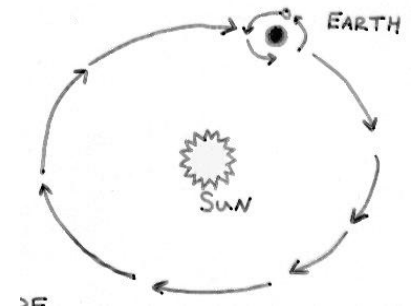
Nicholas Copernicus (1473 – 1543), a Polish astronomer hired by the Roman Catholic Church to reform the Church calendar and bring it into line with the solar calendar, began to question the geocentric view of the solar system as a result of his research. In his book "On the Rotation of Heavenly Bodies", he suggested the idea that the solar system was Heliocentric or sun centered with the earth revolving around the sun. Copernicus based his book on his 30 years of observation. However, in his book, he only hinted that the Ptolemy and the Church were wrong. Copernicus wanted to avoid challenging the Church during the Reformation and he held off publishing his book until right before his death. In addition, he was not convinced that the whole solar system was Heliocentric. He described a system in which the earth revolved around the sun, and everything else revolved around the earth.



The problem with entangling science and religion was that new scientific discoveries that overturned previous scientific ideas could undermine religious belief. For example, if the earth, and man, were not at the center of everything, then what does it mean of God's plan for mankind? More importantly, it is one thing to discredit one system. It is something to develop a new system that addresses the unanswered questions of the discredited system. If geocentric theory is wrong and the earth is not the center of the solar system, then what keeps the earth from flying off into space?

Copernicus could not answer how a heliocentric system would work. For this reason, he suggested a compromise: the earth rotated around the sun, but everything else rotated around the earth. The scientists who followed Copernicus developed the scientific process to answer how a heliocentric system worked.

Tycho Brache, a Danish astronomer, spent 20 years doing nightly observations of the stars and planets. His recorded information, all done with the naked eye, was the most detailed study of the stars in all of Europe. When Brache died, his assistant Johannes Kepler (1571-1630) took and studied Brache's records. Through detailed study of the Brache's information, Kepler was able to discover three laws of planetary motion:



1. Planets follow elliptical, not circular orbits, around the sun.
2. Planets do not move at a constant speed. Instead they move faster as they approach the sun and slow down as they move away from the sun.
3. There is a direct relationship between a planet's speed and its distance from the sun.

Kepler was unable to determine any more rules of planetary motion because of his limited knowledge of math. While Kepler had strong math skills, mathematics had not yet been developed to handle such complex equations. However, Kepler's laws showed the framework for how a heliocentric system would work and that there are universal laws at work in the universe.

At the same time Kepler was working, Italian scientist Galileo Galilei (1564 – 1642) conducted experiments on the motion of falling bodies. Galileo showed that all falling objects, regardless of weight, free fall at the same rate of speed. While counter intuitive, his experiments showed that all objects are affected in the same way by the same physical laws.

In addition, using the newly discovered telescope, Galileo saw that the planet Jupiter had four moons, that the sun had spots, and that the moon was cratered. He published his findings in his book "The Starry Messenger". Galileo's "The Starry Messenger" shattered the Church's teachings that the stars and planets were perfectly formed and only rotated around the earth on crystal spheres pushed by angels.

The Catholic Church responded by placing "The Starry Messenger" on the Index of Forbidden Books and arresting Galileo. Galileo was tried by the Inquisition and forced to recant his ideas under the threat of torture. However, following his trial, Galileo remarked, "And yet it moves." This quote references the reality that despite the Church's ability to silence Galileo, the earth still moves around the sun. Galileo lived the rest of his life under house arrest.

Scientific Method

An important part of the Scientific Revolution was the development of the "scientific method" or a systematic process for the investigating the world. The scientific method is a combination of using controlled and measured experimentation with rigorous logic to build an understanding of natural processes.

Francis Bacon (1561 – 1626), an English scientist, developed the idea of using experimentation as a component of the scientific method. In his book the “New Instrument” he explained the idea of inductive reasoning: experiment first, form hypothesis, and then experiment again to test the hypothesis. Through this method of systematic experimentation, scientists could develop an understanding of how the world really works. Bacon thought that scientists should work together for the common goal of advancing knowledge. The Royal Society for the Improvement of Natural Knowledge was founded in 1622 for the purpose of encouraging scientists to share their work and debate their findings and theories. Four years later, the Academie des Sciences of Paris was founded under the rule of Louis XIV.

In contrast to Bacon, Rene Descartes (1596 – 1650), a French mathematician, in his book “Discourse on Method” outlined the system of deductive reasoning: Prove things through the use of logic and reasoning. Descartes used deductive reasoning to even prove his own existence, which he did in his famous statement, “Cogito, ergo sum” or “I think, therefore I am.” This was part of a process Descartes used called skepticism, in which he questioned anything which was not directly provable

In a time when religion was center of how people viewed the world, to make a statement of existence that ignored God was a radical idea. As a mathematician using deductive reasoning, Descartes developed analytic geometry. Analytic geometry is the use of mathematical equations to demonstrate cause and effect relationships. For example, the equation “ $Ax + B = y$ ” shows the relationship between “x” and “y”, and that the value of one determines the value of the other. Algebra is a mathematical tool that allows scientists to demonstrate and test relationships, such as the movement of the earth around the sun. Descartes work gave astronomers the tools they needed to translate the movement of stars and planets into mathematical equations that could be used to explain how the universe worked.

Isaac Newton (1642 – 1727)

Isaac Newton, in England, explained how Copernicus’s heliocentric solar system worked in his book “Mathematical Principles of Natural Philosophy” (1687). This book is perhaps the most important science book ever written. The scientific principles developed by Newton created a model of the universe that held until Albert Einstein published his “General Theory of Relativity” in 1916.

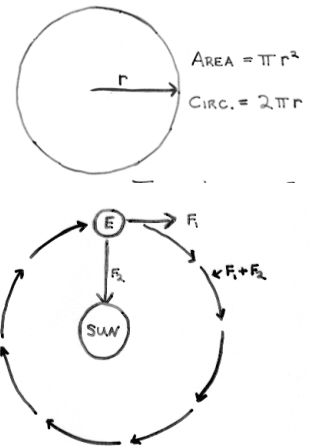


In order to develop an understanding how the solar system worked Newton invented the mathematics of calculus. Based on algebra, calculus, through manipulating equations, can show the area, distance, speed, and rate of change of any planet, star, or other object whose movement can be expressed as a mathematical equation.

Newton used the deductive reasoning of calculus to explain how everything in the solar system worked in a simple and elegant manner. Calculus allowed Newton to discover three laws of motion:

1. An object will only move if a force acts upon it.
2. There is a direct relationship between the speed of an object and the force that acted upon it; objects move in a straight line from the force that acted upon it.
3. For every action, there is an equal and opposite reaction.

Newton used the inductive reasoning of experimentation to show that these laws of motion were universal. Nothing in the universe could resist them. In addition, Newton was able to explain that it was gravity that kept the earth from flying off into space. Newton described gravity was a force in which all objects attract each other with a force proportional to their mass.



Through the language of math, Newton demonstrated that the universe was a well-regulated system that acted according to laws of nature that could be understood by people. The Newtonian System did not have a place for an active God. God might have created the solar system, but it ran by its own laws like a machine. This Newtonian view of the universe gave rise to a religious belief called deism, which believed in divine but inactive force had created the universe. Many of the Founding Fathers of the United States, such as Benjamin Franklin, considered themselves to be deists.

“If I have seen farther than others, it is because I have stood on the shoulders of giants.”
- Isaac Newton

Enlightenment (1688 – 1790)

The Age of Enlightenment was a period in European history when people believed that through the use of reason and rationality all the problems of human society could be solved. Just as Newton had used science to explain the universe, the thinkers of the Enlightenment, called philosophes or “lovers of wisdom”, wanted to apply reason to human society. They believed that people were rational and that society was perfectible if its members were free, equal, and followed the laws that governed human society. They adopted the concept of universality from science and applied it to human society. They believed that there was a type of

political, social, and economic system that was the ideal form for all human societies. The Enlightenment gave birth to the liberal tradition in Western Europe and the United States. The liberal tradition called for free and open societies based on Locke's ideas of a social contract.

An important aspect of Enlightenment thinking was the idea of Humanitarianism. Humanitarianism is the belief that it is a human being's duty to improve the lives of other people. Supporters of the Enlightenment sought use the tools of rationality and an understanding of "natural laws" to make the world a more fair, free and just. More importantly, they tried to use the force of argument to accomplish this goal. As a result, the Enlightenment became connected to promoting democracy, legal protection for "natural rights", and ending abusive and cruel systems such as slavery and serfdom.

The work of the philosophes was encouraged by wealthy members of the middle class who patronized Enlightenment thinkers, artists, and writers, as well as organized salons or social gatherings and performances. Salons provided places for Enlightenment thinkers to meet to discuss ideas and find support from wealthy patrons for their projects.

The philosophes and their patrons in salons represented the upper classes of European society, who had the wealth and time to engage in intellectual pursuits. However, the Enlightenment blossomed because the ideas of the philosophes were read, debated and adopted by the middle class in the countries of Western Europe, particularly England and France. During this period, coffee houses, a meeting place of businessmen and merchants, became an intellectual focal point for the Enlightenment.

The work of Denis Diderot in editing and compiled the "Encyclopedia" was an example of how Enlightenment ideas were disseminated to the middle class. Diderot's Encyclopedia, which was published in 28 volumes published over two decades beginning in 1751, sold between 14,000 and 16,000 copies. This encyclopedia collected the thoughts and works of philosophes in one body of work and then spread the ideas across Europe. In fact, many Enlightenment thinkers such as Voltaire and Rousseau wrote articles for the Encyclopedia. In addition to written articles, the Encyclopedia is also famous for its 3000 pages of illustrations showing everything from medical procedures to technical inventions and natural science. Diderot's Encyclopedia "digested" important ideas and presented them in a readable form to their middle and upper class readers.

In addition to books, Enlightenment thinkers published magazines, newspapers, and pamphlets, which were widely read and distributed in coffee houses. Joseph Addison, the editor of the British magazine, The Spectator (which has sales of 30,000 copies and issue), said his goal was to "bring philosophy out of closets and libraries, schools and colleges, to dwell in clubs and assemblies, at tea tables and coffee houses."

However, the works of many Enlightenment thinkers were banned and the thinkers were often arrested or forced to flee their countries. For example, Diderot's Encyclopedia was banned by French King Louis XV. England and the Netherlands became places of refuge for these writers.



Voltaire

French writer Voltaire was the most recognized figure of the Enlightenment. Voltaire was a satirist. He used humor - primarily irony, sarcasm, and ridicule - to attack any person, group, or government that he found to be an enemy of the Enlightenment. Voltaire's most famous book "Candide" was an attack on hopeless optimism in the face of human cruelty and natural tragedies. In the book, the main character Candide is beset by human cruelty and tragedy, and yet tries to hold to his belief that he lives in the best of all worlds and that "all is for the best". It concludes with Candide acknowledging that this is not the case and that the only way to shut out the stupidity and cruelty of the world is to lose oneself in satisfying work. While many in France considered Voltaire a hero, his wicked satire of people in power forced him to live on the border of Switzerland, always ready to escape to avoid arrest. In addition, Voltaire worked to fight injustice by championing the cause of Jean Calas, who had been brutally executed after being falsely accused of murdering his son so he would not be converted to Catholicism. After three years of advocating, Voltaire succeeded in having Calas name cleared. However, Voltaire did not support the ideas of democracy. Instead, he believed in "enlightened despotism" in which a monarch used knowledge and wisdom to improve society. Voltaire was friends with Fredrick the Great, king of Prussia, who supported the arts and sciences, abolished torture and censorship, and reformed Prussia's legal system.

Baron de Montesquieu (1689 – 1755)

French philosopher Montesquieu believed that the best type of the government was one where there was a separation of power into three branches of government. His beliefs were inspired by ancient Rome and Parliament in England. He said that a government where power was divided into three branches, with each branch limiting the power of the others, would provide the most liberty. He proposed that the three branches be:

1. Executive – Leader who carries out the law of the government.

2. Legislative – Representative body of government that makes laws.
3. Judicial – Judges who interpret laws.

In his book, “On the Spirit of Laws”, he argued against the type of absolute power held by the monarchs of Europe. He believed that a good government was limited by institutions and laws. Montesquieu’s work had a direct impact on the development of the government of the United States.

Adam Smith (1723 – 1790)

Adam Smith is the father of economic thought. Smith was opposed to mercantilist policies. According to Smith, there was no role for the government in business or the economy. He believed in a “free market economy” and that the government should follow a “laissez faire” policy and allow free trade between nations. Smith said that this policy would create greatest wealth for all nations. His book, “The Wealth of Nations”, applied reason and logic to human behavior with the goal of developing “laws” of economics. Smith believed that these three laws governed all economic systems:

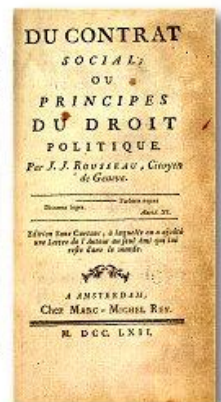
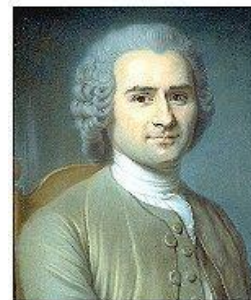
- Law of Self-interest – People operate out of their own self interest.
- Law of Competition – Competition between sellers will produce the lowest price for goods.
- Law of Supply and Demand – The market price will always result in a situation where the quantity buyers want equals the quantity offered by sellers.



Smith said that when people acted individually for their own benefit it created an outcome that was to the benefit of society. Markets forced people to connect their own self interest to public welfare. For Smith, there was no need for the government to dictate or control the economic system of a country. Smith said that the laws of economics worked as an “invisible hand” to guide society to the best economic outcome. Smith summed up this idea in his book The Wealth of Nations when he wrote, “It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our necessities but of their advantages.” Smith published The Wealth of Nations in 1776 – the same years Britain’s North American colonies declared independence.

Jean Jacques Rousseau (1712 – 1778)

Rousseau had little impact during the Enlightenment, but had a tremendous influence on the French Revolution. In many ways, Rousseau represented a radical version of Enlightenment ideals and often took many of the ideals and upended them. In contrast to many Enlightenment thinkers who stressed the liberty and rights of the individual, Rousseau viewed people as intertwined by their relationships into a society. In essence, the society was more important than the individual since the individual could only achieve anything by being a member of society. However, Rousseau was at odds with the absolute monarchies that dominated Europe. He believed that participation in democracy would bind people to their societies. In his book, the “Social Contract”, Rousseau said that liberty and justice could only exist in a democracy that was ruled by the “will of the people”. He held that the “will of the people” would always be right and that to obey this government was to realize freedom. Rousseau went on to argue that the government should promote a civic religion that would create a moral society. Rousseau was idolized by many of the revolutionaries in the French Revolution.



**“Man is born free, but today he is everywhere in chains.”
-Rousseau**

American Revolution

After struggling through the English Civil War, and the Glorious Revolution, England built the largest colonial empire in the world. By the end of the Seven Years War (French and Indian War) Britain had added Canada, the East coast of North America all the way to the Mississippi River, India, and part of the Caribbean Sea, to its Empire.

The British believed in mercantilism and thought that the only use for colonies was to make money and supply the home country with natural resources. For this reason, the British colonies could only do business with Britain or other British colonies. British Parliament passed the Navigation Acts, which forced these mercantilist ideas upon its colonies. According to the Navigation Acts, British colonies could only trade with Britain and could only use British ships. The goal was to exclude the Dutch from trading in the British Empire. In some parts of the British Empire, British joint-stock companies, such as the British East India Company, ran colonies.

British King George III and Parliament placed taxes on the North American colonies to pay for the Seven Years War and cover the cost of stationing of British soldiers in North America. From the British perspective, these taxes seemed justified and

appropriate. This was especially true considering that the people in the North American colonies were more prosperous and less taxed than the people in England. Still, the combination of taxes and the Navigation Acts led to the American Revolution.

The leaders of the American Revolution were inspired by the Enlightenment. The formation of the United States of America represented the ideal of Enlightenment thought put into action. Thomas Jefferson used John Locke's ideas in writing the Declaration of Independence. The basic principle was that "taxation without representation" was the equivalent of theft. Parliament was violating the colonists natural right to property and had violated the social contract. The Declaration of Independence served as the intellectual justification for the rebellion of the thirteen British colonies in North America.

The revolutionary implications of this rebellion were fully realized informing the new government for the United States. Again, the formation of the government was based on Enlightenment ideals. Montesquieu's concepts of a government in which power was divided into three branches were brought to life in the Constitution of the United States. In addition, the first ten Amendments to the Constitution, known as the American Bill of Rights, were based on John Locke's idea of "natural rights" and England's Bill of Rights. The formation of a republican democracy in the United States justified naming the American revolt for independence the American Revolution.

While France did not support the ideals of the American Revolution, it gave military and financial support to the American Revolution to get back at its enemy, Britain, for the Seven Years War. However, the realization of Enlightenment ideals witnessed in the American Revolution had unintended consequences that would come back to France in the form of the French Revolution a decade later. The French government had supported the American Revolution and the American Revolution inspired the French Revolution.