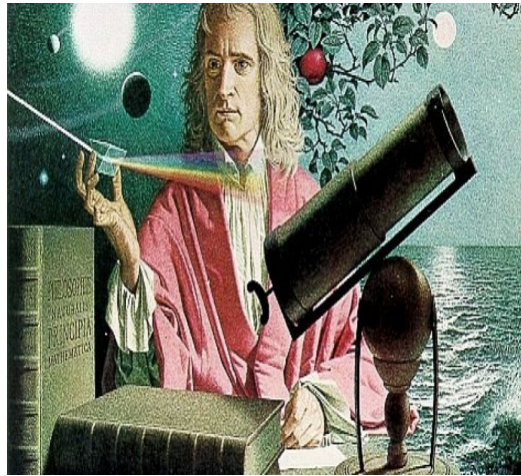


Unit 3D: Scientific Revolution and The Enlightenment

European expansion was driven by a desire for economic and political dominance. New technological advances made exploration possible. Exploration increased global interactions, which resulted in significant economic, political, and social transformations around the world. As a result, dominant societies emerged which led to a struggle for world power.



John Locke
1632–1704

- Government's power is limited.
- People have natural rights, such as life, liberty, and property.



Charles-Louis Montesquieu
1689–1755

- The powers of government should be separated into separate branches.

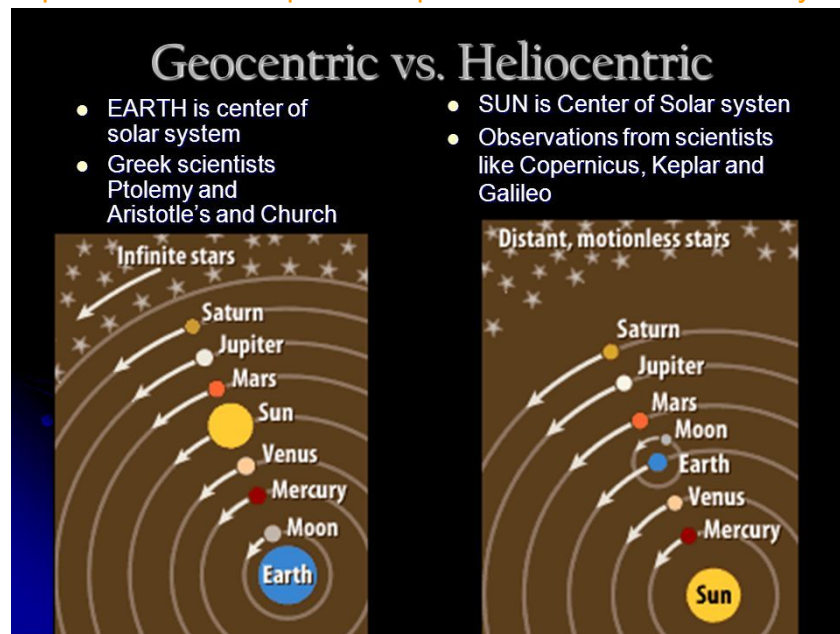


Jean-Jacques Rousseau
1712 –1778

- Governments should express the will of the people.
- People enter into a social contract with their government, giving it the right to create and enforce laws.

The **Scientific Revolution** emerged out of the advancements made in the areas of science and math in the late 1500s and early 1600s. Following the age of exploration, new truths and new research challenged previous thought processes and studies. As evidence mounted, scientists began to question ancient theories and teachings of the Roman Catholic Church. These scientists began using reason and logical thinking instead of placing their beliefs in faith. They demanded proof or evidence.

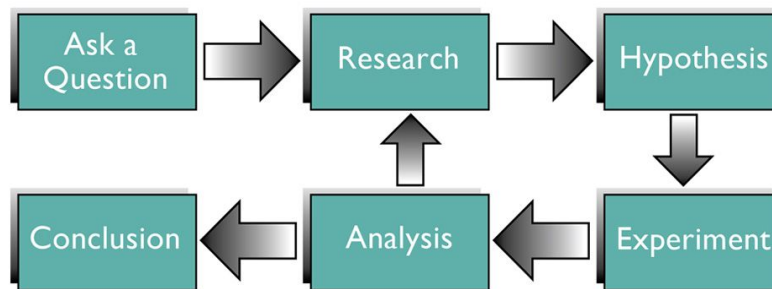
Claudius Ptolemy was an old world thinker before the Scientific Revolution. His belief of planetary motion was the **geocentric theory**, which taught that Earth was at the center of the universe and everything revolved around Earth. The Roman Catholic Church agreed with and taught this theory. **Nicolaus Copernicus** questioned Ptolemy and the Church. He suggested a **heliocentric theory**, which means that the sun is the center of the solar system and everything revolved around the sun. **Galileo Galilei** improved upon the telescope and used it to prove Copernicus' heliocentric theory.



Isaac Newton's laws of gravity furthered Galileo's laws of motion and continued to challenge the old church theories. With his law of **universal gravitation**, **Sir Isaac Newton** described **gravity** as the mutual attraction between any two bodies in the universe.

An Englishman named **Francis Bacon** believed that unproven ideas from the past should be put aside until they could be proven. He believed that to find the truth of anything, you had to examine the facts. The **scientific method** was a major contribution of this time period, establishing a systematic way to find proof using reason. The scientific method is still used today to test theories and hypotheses. The scientific method is the logical procedure for testing theories that includes beginning with a question, forming a **hypothesis** (an assumption or guess), testing through experimentation, and finally analyzing data to reach a conclusion.

Scientific Method



A significant conflict arose between scientific thought and traditional religious beliefs during this time. The Bible, as interpreted by the Roman Catholic Church, served as authority in all parts of life for society prior to the rise of science. The teachings of the church were based on faith and revelation. The Church felt threatened by science because it offered evidence for its theories. With the publication of these new theories, the teachings of the Bible and the church were called into question. This was a challenge to faith by reason.

All of these challenges to authority inspired the philosophers of the **Enlightenment** to then begin using reason to apply it to the political environment in Europe. Through the use of reason, Enlightenment philosophers began developing ideas that challenged the unlimited governments of the time and influenced the development of limited governments in the 1600s and 1700s.

The **Enlightenment** was seen as an intellectual, or academic, movement of the 17th and 18th centuries. It sought to apply “reason” to society in order to better understand and to improve it.

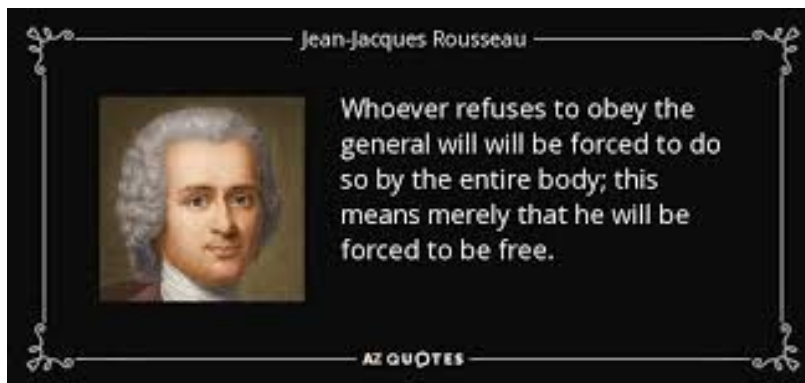
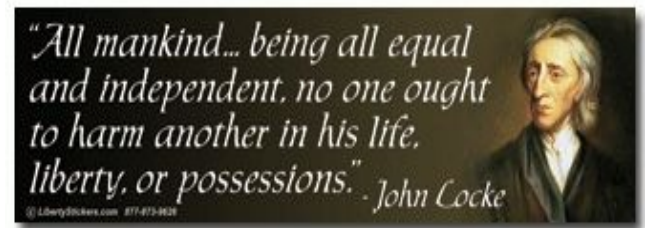
Politics (government) was one of the areas where “enlightened” philosophy, or thinking, was applied.

Absolutism was the basis of most governments in Europe at that time, and these unlimited governments placed total or absolute power in the hands of the rulers. Most of the governments were **absolute monarchies** based on **divine right**, the belief that rulers received their power directly from God, and therefore citizens were expected to obey all decisions of the rulers without input or challenges. Because of this, citizens did not have any guaranteed rights.

The political philosophy of the Enlightenment presented a differing view. The Enlightenment provided a direct challenge to absolutism and therefore influenced the development of **limited government**.

Enlightenment philosophers believed the **state of nature** was how humans lived before organized government. It was used by philosophers to explain how political organization occurred. The **social contract theory** was the idea that government was created as an agreement or contract between people and their government. This was established to structure the “contract” in a mutually beneficial manner. These two components, state of nature and social contract theory, were used by philosophers during the Enlightenment to examine and classify government.

John Locke of England is considered one of the great political philosophers of the Enlightenment. Influenced by the Glorious Revolution, Locke saw the state of nature as a good place and the social contract as a voluntary agreement to enhance life. Locke believed all humans were born with **natural rights**, which included life, liberty, and property. This presented a challenge to absolutism. According to Locke, the social contract was an agreement between the citizens and their government, and the government’s responsibility was to protect the natural rights of the people. Locke argued that if the government did not protect these natural rights, then the people had the right to break the contract by abolishing (ending) the government and creating a new one. Locke’s ideas developed into the concept of the **consent of the governed**, or the belief that a government gets its approval or “consent” from the people.

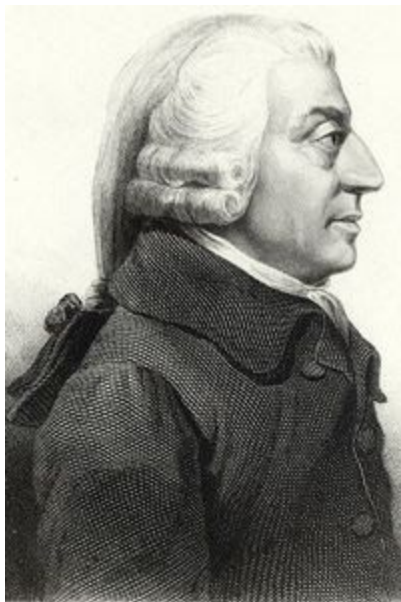
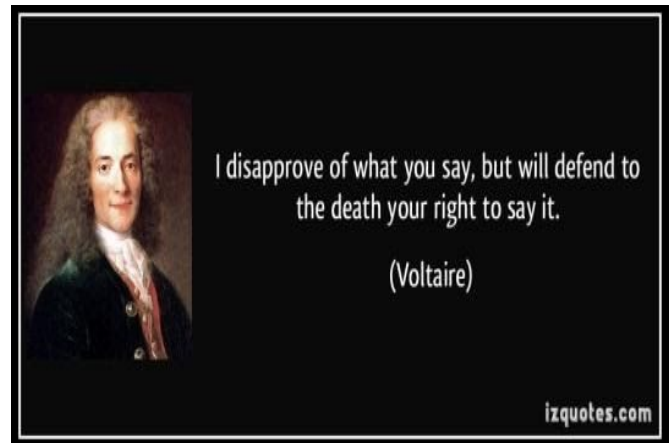


Jean-Jacques Rousseau of France had a similar belief about the state of nature but his viewpoint was different about the role of government. Since Rousseau saw society as the corrupting influence on people, he believed it was the role of government to protect the **general will**, or

common good, of the people. He believed that it was the government’s duty to implement policies deemed beneficial for the people, or by basing decisions on majority rule. Rousseau’s view of the social contract would create a limited government because the government’s power would be limited by what the majority of citizens wanted. Rousseau’s ideas, along with those of Locke, formed the foundation for the idea of popular sovereignty which is used in limited governments today. **Popular sovereignty** is the concept that political power resided with the citizens. American colonists largely rejected Rousseau, but his writings would later provide part of the foundation for totalitarian governments.

Baron de Montesquieu of France focused on the organization of government by promoting the ideas of separation of powers and checks and balances. By creating a **separation of powers**, a government must be limited as each branch holds a different job within the government. The branches are then able to check the others' powers in order to keep them balanced, which is known as **checks and balances**. Montesquieu greatly admired the English system of limited government from which he adopted these concepts. These concepts did not originate with him, but he was largely responsible for popularizing them and he advocated modifying the English system of the time of having two branches, executive and legislative, to having three branches, the **executive** (monarch), **legislative** (Parliament), and **judicial** (courts). The influence of his ideas is readily apparent in the United States Constitution.

Voltaire, the pen name of François-Marie Arouet of France, focused on **civil liberties**, rights guaranteed by the laws of a country, mainly freedom of speech and freedom of religion. Voltaire's influence on limited government is mainly in the area of rights of the citizens. He wrote many books and plays to demonstrate the use of reason and voice his views on **social reform**, or the betterment of society. He often exhibited his dislike of religious intolerance, advocating a separation of church and state and modeling the right to express personal opinion through free speech.



The rising middle-class believed that the government should not interfere with business or society in general. A British economist named **Adam Smith** supported this idea in his book *The Wealth of Nations*. Smith wrote that any government should stay out of the economy and allow businesses to compete. This competition between businesses that make the same kind of product will keep prices down and wages up as the businesses compete with each other over workers and sales. By allowing this to occur, the government would be practicing something called "**laissez faire**", which is French for "to let be". Smith's theory was very popular with business owners that did not want to see the government interfere in their ability to make as much money as they could.

Questions for Scientific Revolution and The Enlightenment

1. Why is it important to find evidence or proof?
2. How do the geocentric and heliocentric theories differ?
3. What is the importance of Newton's Law of Universal Gravitation?
4. Why would the church feel threatened by the ideas of the Scientific Revolution?
5. What are some of the differences between limited government and an absolute monarchy?
6. What were Locke's "natural rights" and why were they important?
7. How would Rousseau's ideas, such as popular sovereignty, provide foundation for future totalitarian governments?
8. How does separation of powers and checks and balances help keep a government from becoming "unlimited"?
9. What two freedoms did Voltaire focus on and why are they considered "Civil Liberties"?
10. What group would benefit the most and least from a government that practiced *laissez faire*?