

Galileo Galilei

Galileo Galilei (1564–1642) was an Italian astronomer, philosopher, and mathematician, and an important figure in the Scientific Revolution. Galileo used the scientific method to challenge long-accepted views about nature and man's place in the universe.

Background and Personality Galileo Galilei was born in the Italian city of Pisa. When Galileo was 17 he went to the University of Pisa and became fascinated with mathematics. He decided to make the study of mathematics and philosophy his profession. He quickly rose to fame with his ingenious theories about the nature of gravity.

Throughout his life Galileo was a troublemaker. He was intensely argumentative and many described him as having an unpleasant manner. His personality gained him many enemies. However, it was also central to the groundbreaking discoveries he made. Only a bold, defiant person such as Galileo would be willing to directly challenge theories about the world that had been widely believed for centuries.

Talents and Achievements Most scholars in Galileo's time thought that the ideas of classical authorities such as Aristotle could never be improved upon, and should just be accepted. Galileo rejected this way of thinking. He used the scientific method of experiment and observation to investigate the world.

Galileo was especially interested in problems of motion. In ancient times, Aristotle had claimed that heavy objects fall faster than lighter ones. Galileo disproved this by dropping objects of different weights off the famous leaning Tower of Pisa. He observed that objects of different masses hit the ground at the same time, in contrast to what Aristotle's theory predicted.

Galileo next turned his curiosity toward the sky. Using the newly invented telescope, Galileo saw that the moon's surface was rough and uneven. He discovered four of the moons that revolve around the planet Jupiter. He also determined that Venus was a planet and not a star, as had been thought.

Galileo also rejected the geocentric theory of the universe. This idea placed Earth at the center of the universe. Galileo's observations of the sky supported the heliocentric theory, which had been developed by the astronomer Copernicus. This theory positioned the sun at the center of the universe. The Catholic Church supported the geocentric theory and feared that attacks on it could lead people to doubt the Church's teachings. In 1633 Galileo was charged with heresy and was forced to take back his ideas. However, Galileo's denial of his own work could not change its influence. Galileo helped to set the groundwork for the modern scientific view of the world. In 1992 Pope John Paul II even apologized for the Church's treatment of Galileo.

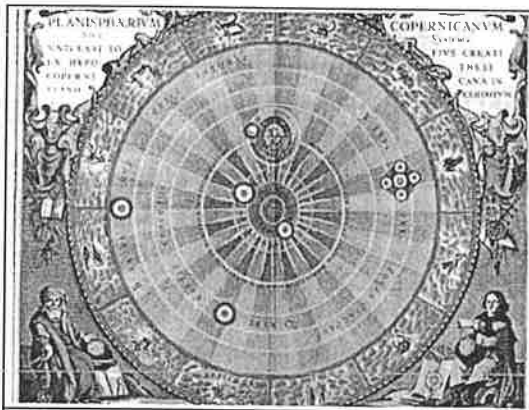
Quotations from Galileo Galilei

"The Bible shows the way to go to heaven, not the way the heavens go."

"Facts which at first seem improbable will, even on scant explanation, drop the cloak which has hidden them and stand forth in naked and simple beauty."

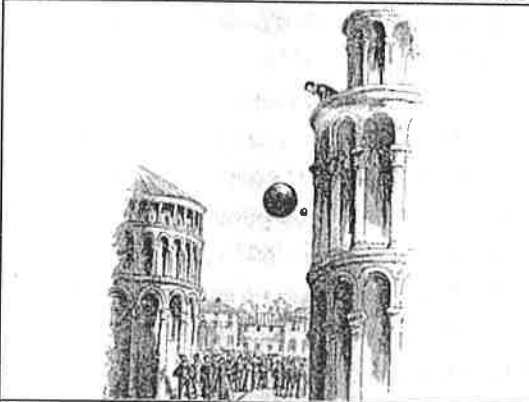
"I do not feel obliged to believe that the same God who has endowed us with sense, reason, and intellect has intended us to forgo their use."

Galileo Galilei



Copernicus's heliocentric theory put the sun at the center of a solar system. Before his work, most people thought the sun, planets, and universe revolved around Earth.

Discuss: How did Galileo's discoveries support Copernican theory?



Galileo tested his ideas about gravity by dropping two balls of different sizes and weights from the top of the Leaning Tower of Pisa.

Discuss: What was the result of Galileo's experiment? How does his experiment relate to the scientific method?



In this sketch, Galileo illustrates that the moon is not perfectly smooth, as Aristotle had previously taught.

Discuss: What other new discoveries did Galileo make?



Galileo was tried before the Roman Catholic court known as the Inquisition for heresy by going against Church teaching.

Discuss: How did Galileo's ideas transform Europe at the time? How do his ideas affect us today?

John Locke

John Locke (1632–1704) was an English philosopher. His thinking about government and people’s rights had a major impact on the Enlightenment.

Background and Personality John Locke was born in the countryside of England in 1632. When he was young, he showed intelligence and academic promise, and he earned a spot at a prestigious boarding school in far-off London. At the age of 20 he entered Oxford University.

Locke was greatly influenced by his father. Between 1642 and 1651, during Locke’s childhood, a civil war raged in England. The war was fought between those loyal to King Charles I, who supported absolute monarchy, and those who supported the Parliament and favored limited powers for the monarch. Locke’s father fought on the side of the Parliamentarians. John Locke’s political philosophy came to reflect his father’s belief in limited government.

Talents and Achievements In the 1680s, another crisis developed in England. The new king, James II, was Catholic. His enemies in Protestant England feared that he wanted to put Catholics in power. In 1688, they forced James to flee the country. Parliament gave the crown to James’s Protestant daughter Mary and her husband, William. Parliament also passed a bill of rights which strengthened the power of Parliament as the representative of the people. This change in government is known as the Glorious Revolution.

Locke approved of these changes in England. At this time he had already written much of his most important work, *Two Treatises of Government*. However, he added a preface before it was published in 1690 to argue that his book offered a theory of government that justified Parliament’s actions. In *Two Treatises of*

Government, Locke denied the divine right of monarchs to rule. The true basis of government, he wrote, was a social contract, an agreement in which free people give power to a government in exchange for its protections. Under this agreement, the purpose of government was to protect people’s natural rights. Natural rights were defined as rights that belong to people “by nature,” simply because they are human beings. These included the right to life, liberty, and property.

According to Locke, the people are the sole source of power. They agree to give power to the government to rule on their behalf. Therefore, according to Locke’s social contract, a government’s authority was based on the consent of the governed. If the government failed to respect people’s rights, it broke the contract and could be overthrown.

Locke’s view of government had a wide influence. In 1776, his ideas would be echoed in the American Declaration of Independence.

Quotations from John Locke

“All mankind . . . being all equal and independent, no one ought to harm another in his life, health, liberty or possessions.”

“The reason why men enter into society is the preservation of their property.”

“The end of law is not to abolish or restrain, but to preserve and enlarge freedom. For in all the states of created beings capable of law, where there is no law, there is no freedom.”

John Locke



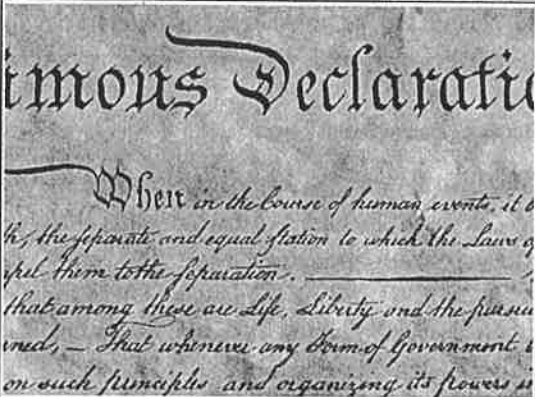
In 1688, William and Mary were offered the English crown in exchange for allowing Parliament to pass the English Bill of Rights. This document limited the power of the monarchy and also listed some individual rights.

Discuss: What type of government did Locke favor and why?



Locke argued that government was a social contract among free people. The people are the source of power and allow the government to rule on their behalf.

Discuss: According to Locke, what is the purpose of government?



Locke's list of natural rights—life, liberty, and property—are referenced in the American Declaration of Independence.

Discuss: According to Locke, when can a government be overthrown and why?



This fence clearly illustrates the concept of private property.

Discuss: How did Locke's ideas transform Europe at the time? How do his ideas affect us today?

Montesquieu

Montesquieu (1689–1755) was a French political philosopher of the Enlightenment. His famous “separation of powers” theory forms the basis of much of our thought on government today.

Background and Personality Charles-Louis de Secondat was born in France in 1689. He is better known by his title, the Baron de Montesquieu. His father was a nobleman of modest wealth. In his youth, Montesquieu attended a Catholic school. Later he became a lawyer. When his uncle died in 1716, Montesquieu inherited the title of baron along with his uncle’s fortune.

Montesquieu was at once critical, insightful, and humorous. He became an admired guest in the Enlightenment salons of Paris, where he was able to demonstrate his cleverness and biting wit. His amusing personality led many to underestimate his abilities as a serious thinker, but they were proven wrong after the publication of his hugely influential book, *The Spirit of Laws*.

Talents and Achievements In 1721, Montesquieu achieved fame as a writer with a satirical book called *Persian Letters*. The book described French society as seen by fictional travelers from Persia. It used humor to criticize French institutions, including the king’s court, the Catholic Church, and each of the social classes in French society. Since the book was both scandalous and funny, it quickly became very popular.

After his literary success with the *Persian Letters*, Montesquieu decided to take a grand tour of Europe, and he spent a long period of time in England. He was a great admirer of the English system of constitutional monar-

chy, which he thought was far superior to the French system of absolute monarchy. Montesquieu’s time in England profoundly influenced his most famous book, *The Spirit of Laws*, which was published in 1748. In this book, he described his theory of how governments should be organized.

Montesquieu was especially concerned with how to protect political liberty. The best way to do this, he argued, was to divide power among three branches of government. In such a system, the legislative branch would make the laws, the executive branch would enforce the laws, and the judicial branch would interpret the laws. In this way, no one branch could become too powerful. Montesquieu called this concept the separation of powers. His theory was based on the English system, in which Parliament made the laws, the monarch enforced the laws, and courts interpreted them. Each branch of government checked, or limited, the power of the others. When powers were not separated in this way, Montesquieu warned, liberty was soon lost.


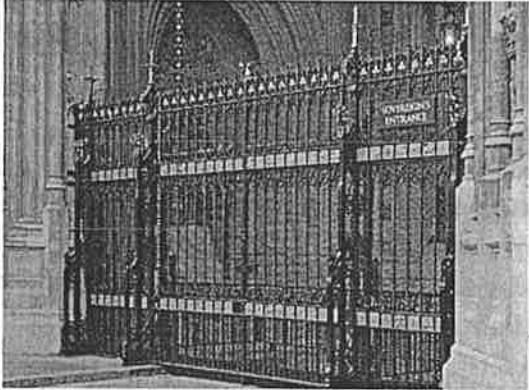
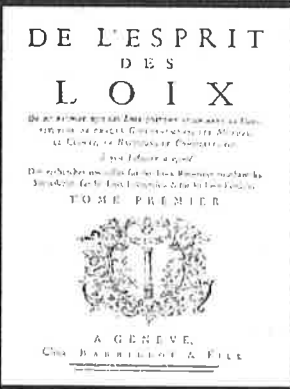
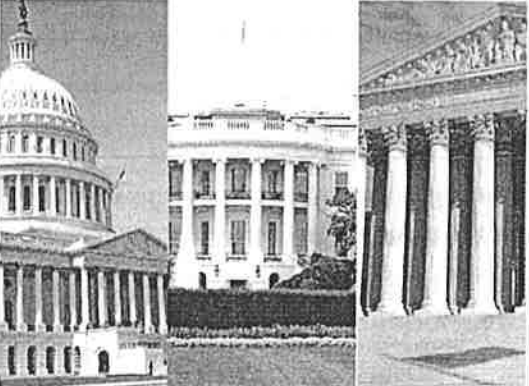
Montesquieu’s ideas had a powerful impact on later thinkers. Among them were the men who wrote the U.S. Constitution. They made the separation of powers a key part of the American system of government.

Quotations from Montesquieu

“The spirit of moderation should also be the spirit of the lawgiver.”

“When the legislative and executive powers are united in the same person, or in the same body of magistrates, there can be no liberty.”

Montesquieu

	<p>Montesquieu's <i>Persian Letters</i> is one of his most famous books.</p> <p>Discuss: What French institutions did Montesquieu criticize and why?</p>
	<p>The "Sovereign's Entrance" is where the monarch of England enters Parliament when it is in session.</p> <p>Discuss: Which two branches of government do the monarch and Parliament represent? What is the third branch of government and what does it do?</p>
	<p>In <i>The Spirit of Laws</i>, Montesquieu explains his theory of how governments should be organized.</p> <p>Discuss: Why did Montesquieu believe there should be three branches of government?</p>
	<p>The American national government consists of a legislative branch, an executive branch, and a judicial branch.</p> <p>Discuss: How did Montesquieu's ideas transform Europe at the time? How do his ideas affect us today?</p>

Voltaire

Voltaire (1694–1778) was one of the most celebrated writers of the Enlightenment. He was a bold champion of religious tolerance and the right to free speech.

Background and Personality Francois-Marie Arouet, who eventually adopted the pen name Voltaire, was born in France in 1694. His mother died when he was very young, and he came under the influence of his free-thinking godfather, the Abbé de Châteauneuf. Voltaire attended a Catholic college in Paris, but the religious instruction he received only made him more skeptical of Christianity. After college he settled on a career in literature.

Voltaire soon earned fame as a writer and as a witty participant in the famous Parisian salons of the Enlightenment. Throughout his life, Voltaire criticized what he saw as intolerance and oppression. His outspokenness and unorthodox ideas often led to conflicts with authorities. He was imprisoned in the Bastille for nearly a year in 1717 when he dared to mock the Duc d'Orleans, who was serving as the regent of France at the time. Several times he was forced to flee Paris or even to go into exile.

Talents and Achievements Voltaire believed passionately in reforming society in the name of justice and human happiness. He warned against what he saw as superstition, error, and oppression. Voltaire publicized his ideas through the plays, essays, and books he wrote. His most famous book, *Candide* (1758), attacked the French court and the power of the Catholic clergy with biting humor.

Like Montesquieu, Voltaire admired England's constitutional monarchy and separation of powers. In one of his periods of exile, Voltaire lived in England for two years. When he returned to France he decided to

present England as a model of government to his fellow Frenchmen, which he did in his *Philosophical Letters* (1734). In his view, the English were governed by law, not by the arbitrary wishes of a single ruler. To be governed by law, he said, was “man’s most cherished right.”

Voltaire championed religious tolerance. He thought religious conflict was one of the main sources of evil in the world. He argued that no single religion possessed all the truth. At the same time, he held that there was a core of truth in all religions which constituted a “natural religion” that reason made available to everyone. Voltaire’s views on religion were quite unorthodox for his time, and his writings and pronouncements at salons scandalized many devout people.

Voltaire also spoke out for the right of free speech. Once he wrote a letter to a man whose views he strongly opposed in which he said that he would give his life so that his opponent could continue to write.

Voltaire’s ideas about religious tolerance and free speech greatly influenced early American political thinkers, who demanded that freedom of religion and free speech be included in the U.S. Bill of Rights.

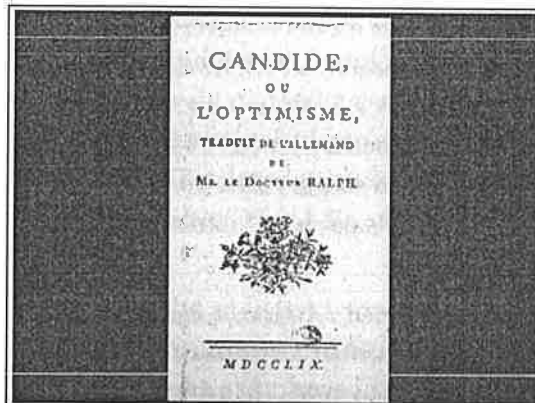
Quotations from Voltaire

“I do not agree with what you have to say, but I’ll defend to the death your right to say it.”

“It is better to risk saving a guilty man than to condemn an innocent one.”

“Think for yourselves and let others enjoy the privilege to do so, too.”

Voltaire



Candide is Voltaire's most famous work. It is a biting and humorous attack on the French royal court and the power of the Catholic clergy.

Discuss: In what ways did Voltaire hope to reform society? What ideas did he speak against?



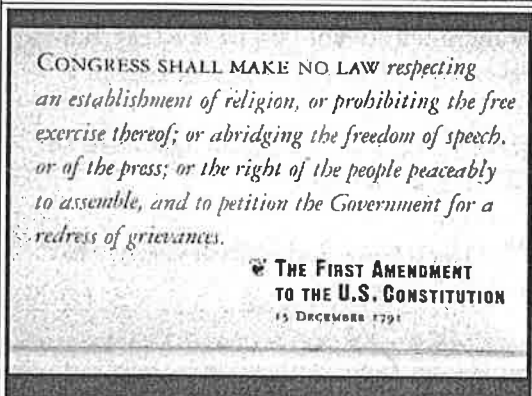
Voltaire was popular in Paris Enlightenment salons, such as this one, for his witty humor and forward thinking ideas.

Discuss: What did Voltaire believe about government?



Voltaire's criticism of government actions sometimes landed him in jail. While imprisoned in the Bastille in France, he wrote the epic poem *Henriade*.

Discuss: What did Voltaire believe about religion and speech?



This plaque displays the first amendment to the U.S. Constitution.

Discuss: How did Voltaire's ideas transform Europe at the time? How do his ideas affect us today?