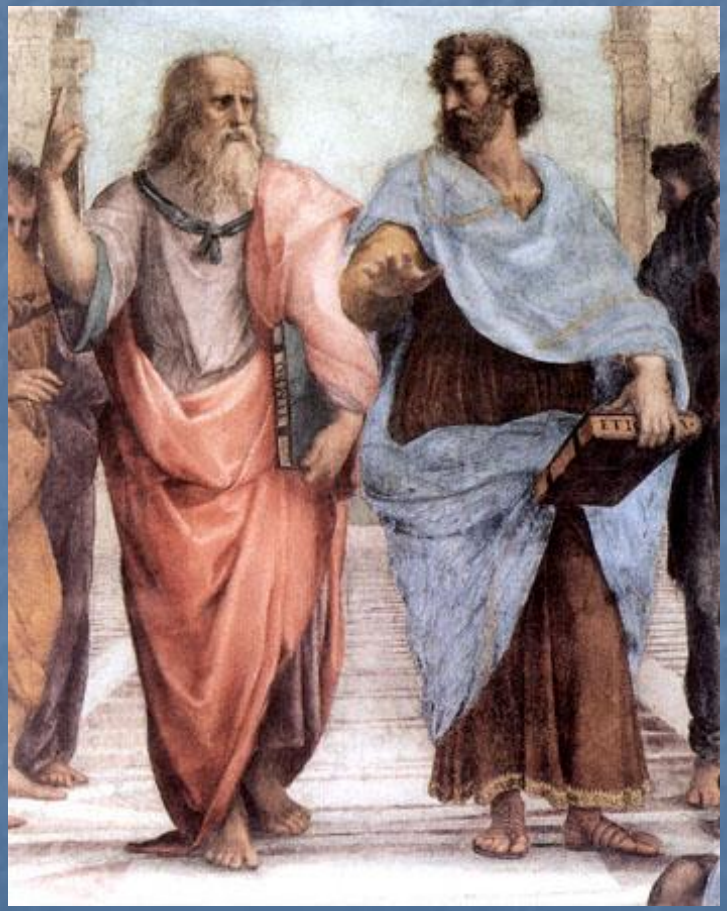
The Scientific Revolution

Key Concepts

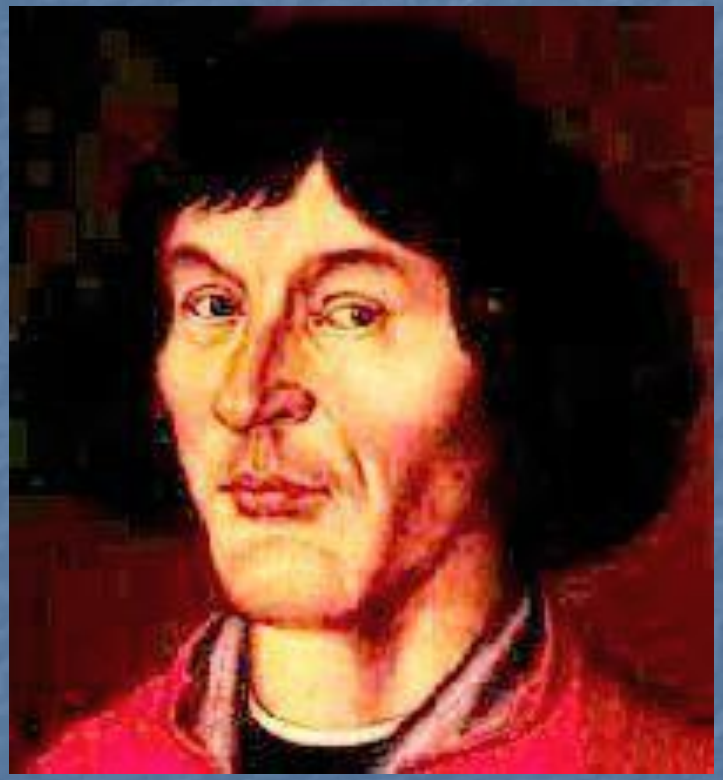
I. The Aristotelian Universe



- Derived from Ptolemy, Aristotle, and Plato
- Classical Writings "Christianized"
- Components of Medieval Cosmology
- Medieval Physics
- Belief in "Matter" and "Form"
- Earth = Living, Protected Sphere

II. Scientific "Revolutionaries"

A. Copernicus (1473-1543)

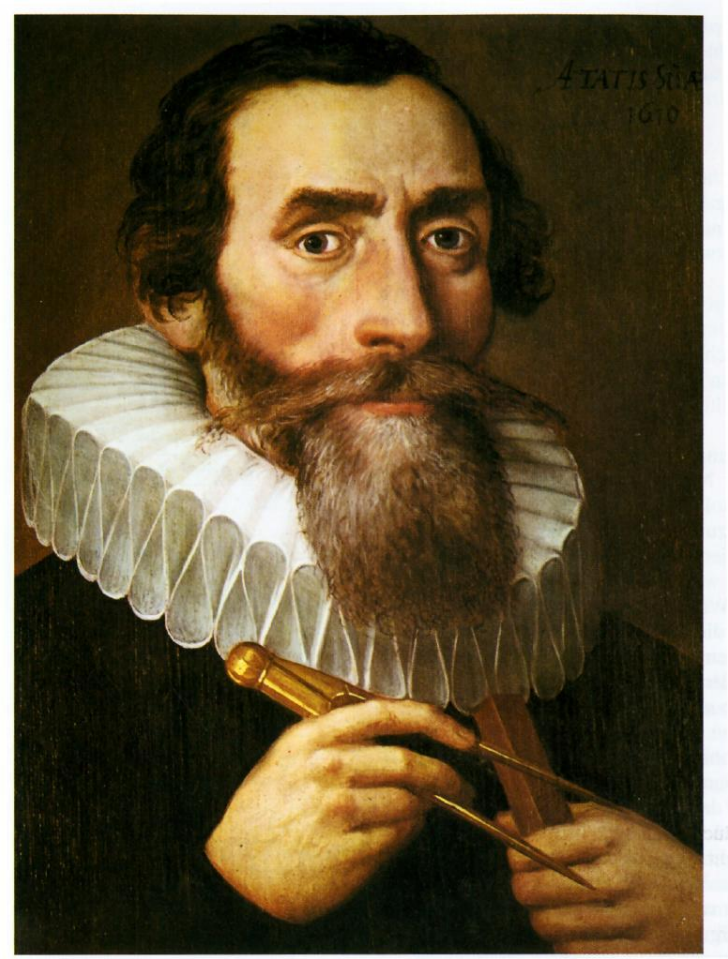


- Aim to glorify God
- Sun-centered universe
- Challenged circular orbits
- Universe of staggering size
- Earth no different than any other planet
- *On the Revolutions of the Heavenly Spheres* (1543)

B. Tycho Brahe (1546-1601)

- Most sophisticated observatory of his day
- Arrogant nobleman
- Remained an Aristotelian
- Discovered comet shooting right through crystalline spheres

C. Johannes Kepler (1571-1630)



- Student of Brahe
- Planetary motion conforms to mathematical formula
- Elliptical orbits
- Planets do not move at uniform speeds in their orbits

D. Galileo Galilei (1564-1642)

- Early practitioner of the experimental method
- Mathematical formula for acceleration of falling objects
- Law of inertia
- His discoveries using the telescope
- Challenges categories of "form" and "matter"
- End of his life

E. Isaac Newton (1642-1727)

- Newton far from the perfect rationalist
- A great synthesizer
- Blends inductive and deductive methods
- Argues for a universe governed by natural laws
- *Principia; Mathematical Principles of Natural Philosophy* (1687)

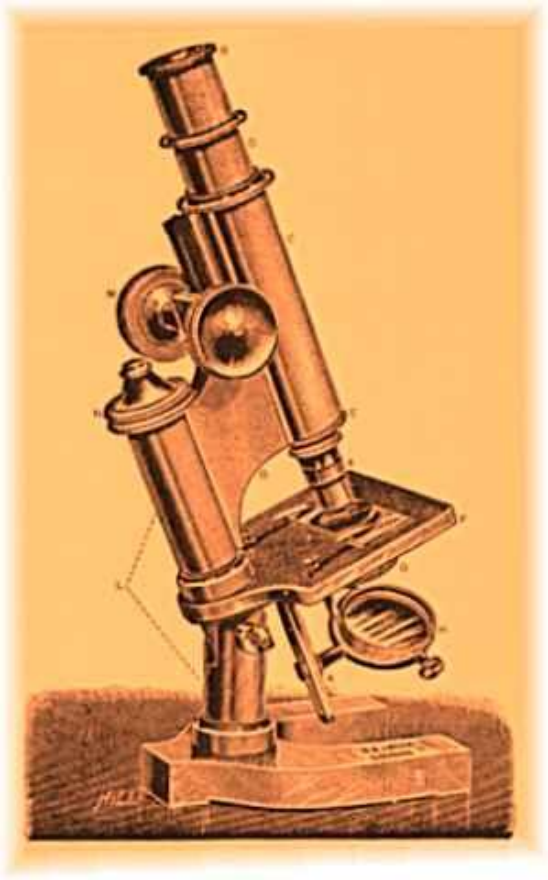
F. Francis Bacon (1561-1626)

- Father of the Scientific Revolution
- The Inductive Method
- Emphasis on practical, useful knowledge
- New attitude toward nature

G. Rene Descartes (1596-1650)

- Significance of Doubt
- The Deductive Method
- Spatial relationships can be expressed in mathematical formulas
- Father of "analytical geometry"

III. Causes of the Scientific Revolution



- Medieval Intellectual Life and Medieval Universities
- The Italian Renaissance
- Renewed emphasis on mathematics
- Renaissance system of patronage
- Navigational problems of long sea voyages
- Better scientific instruments

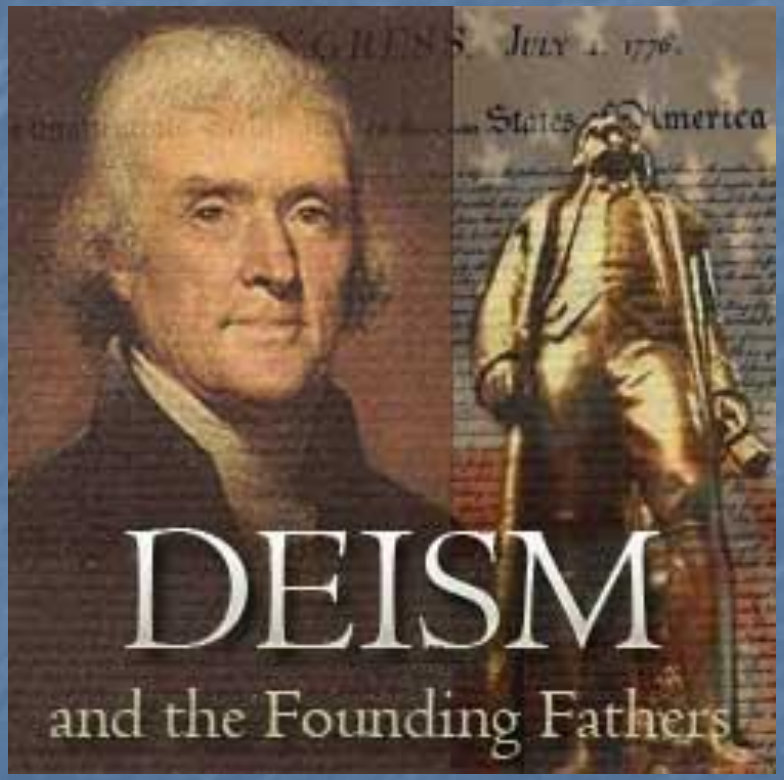
IV. Consequences of the Scientific Revolution

- Rise of the "Scientific Community"

  --Royal Society of London (1662)

  --Academy of Royal Sciences (1666)
- The modern scientific method
- A universe ordered according to natural laws

IV. Consequences of the Scientific Revolution (cont)



- Laws discovered by human reason
- "De-Spiritualized" and de-mystified the Universe
- Mechanical View of the Universe
- Deistic View of God

  --God as the cosmic capitalist

The Enlightenment

"Siecle de Lumiere"

"The Century of Light"

I. What was it?

- Progressive, Rationalistic, Humanistic worldview
- Emerged out of the Scientific Revolution and culminated in the French Revolution
- Spokesmen = Rising Middle Class
- Paris = Center of Enlightenment
- Optimism about mankind's abilities

II. Key Ideas

- Distrust of Tradition and Revealed Religion
- Scientific method could be applied to society as well
- Society can get better as risks are taken
- Man is naturally good
- Good life is on earth

III. An Attack on the Old Regime

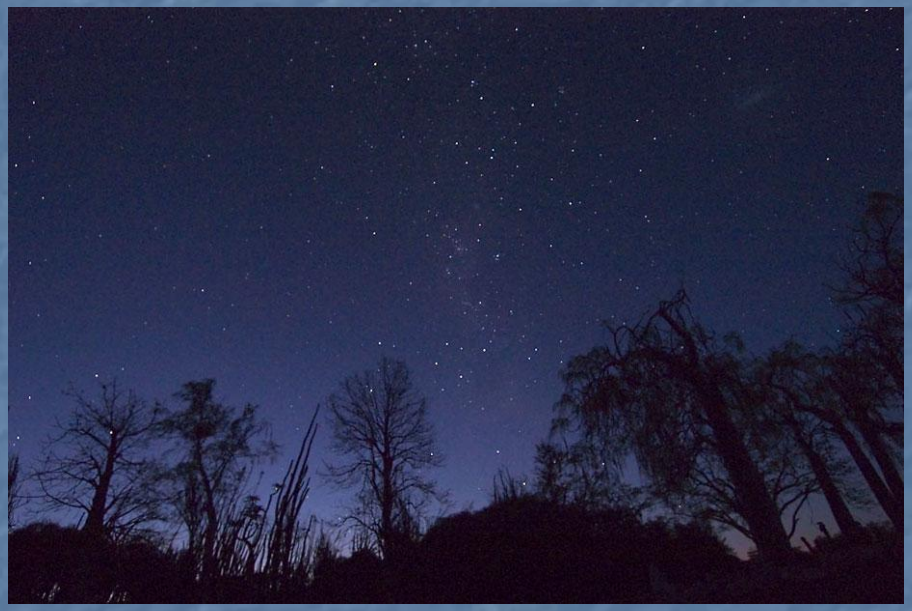
A. The World of the Old Regime

- Built on tradition
- World of hierarchy, privilege and inequality
- Allied with the Church
- Challenged by the reform impulse of supporters of the Enlightenment

B. Conflict with the Capitalistic Middle Class

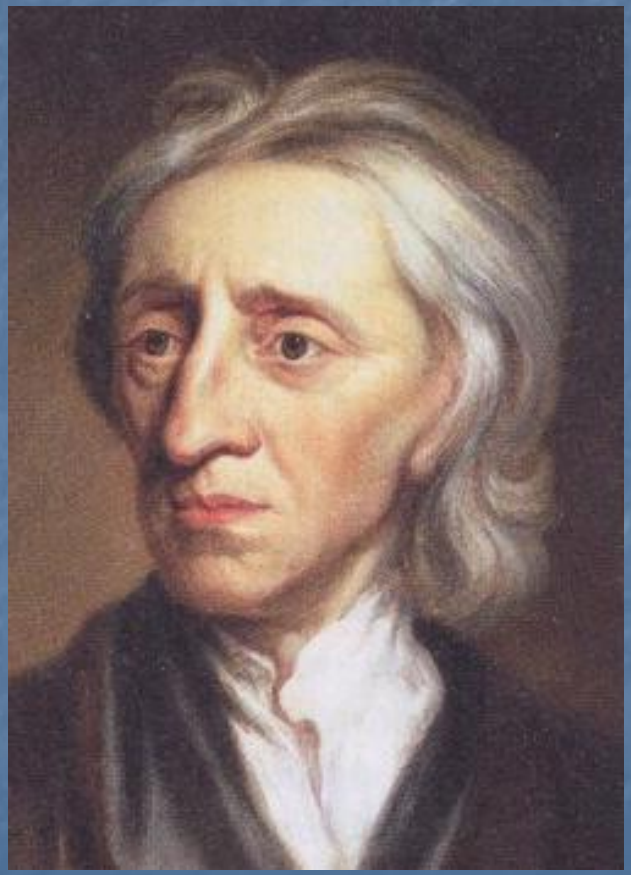
- Support for the Middle Class social order against the traditional social order
- Size and increasing power of the Middle Class
- New notion of wealth
- Tension and discord created by the Middle Class

C. Popularization of Science



- The popularity of science in the 17th and 18th centuries
- *Conversations on the Plurality of the Worlds* (1686)—Bernard de Fontenelle
- The Scientific Revolution promised the comprehensibility of the workings of the universe

D. A New World of Uncertainties

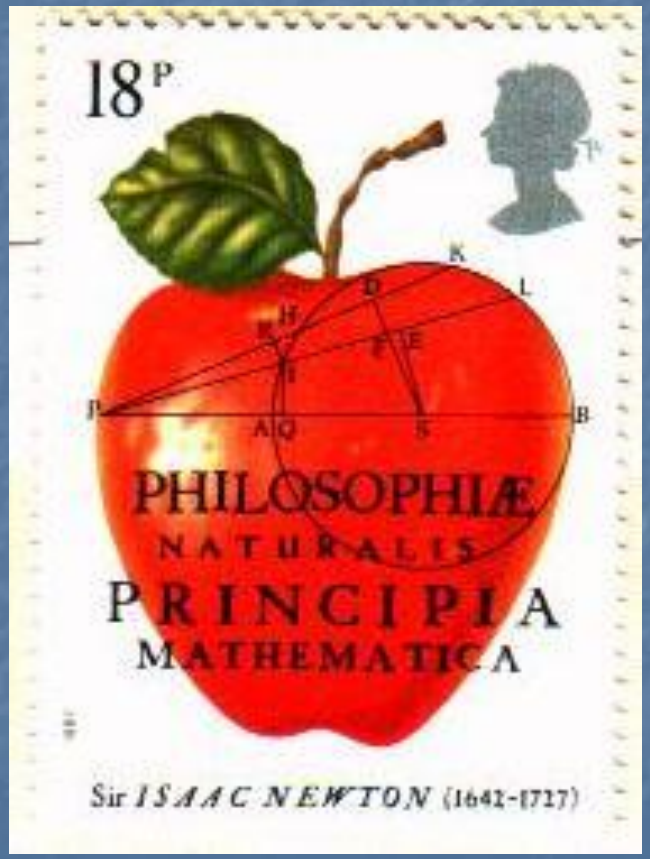


- The Idea of Progress
- The anti-religious implications of the Enlightenment
- The relativity of truth and morality
- John Locke's New Psychology

  --*Essay Concerning Human Understanding* (1690)

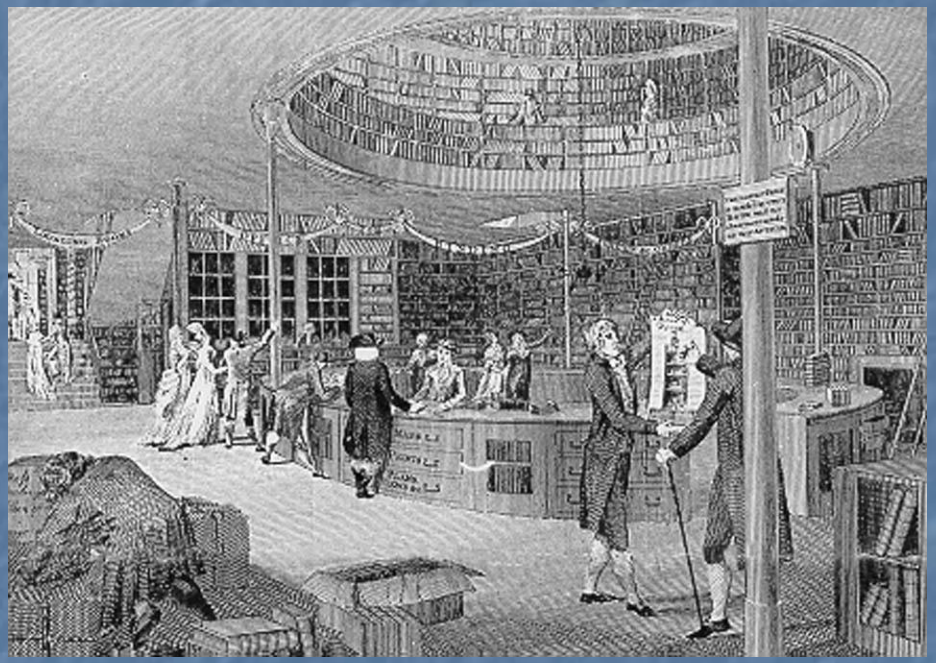
  -- "Tabula Rasa"

IV. The Philosophes



- 18th century French intellectuals
- Interest in addressing a broad audience
- Committed to reform
- Celebrated the scientific revolution
- The "Mystique of Newton"
- Science applied to society

V. The Problem of Censorship



- The attempt of the Old Regime to control new thinking
- Publishers and writers hounded by censors
- Over 1000 booksellers and authors imprisoned in the Bastille in the early 1700's
- Battling censorship

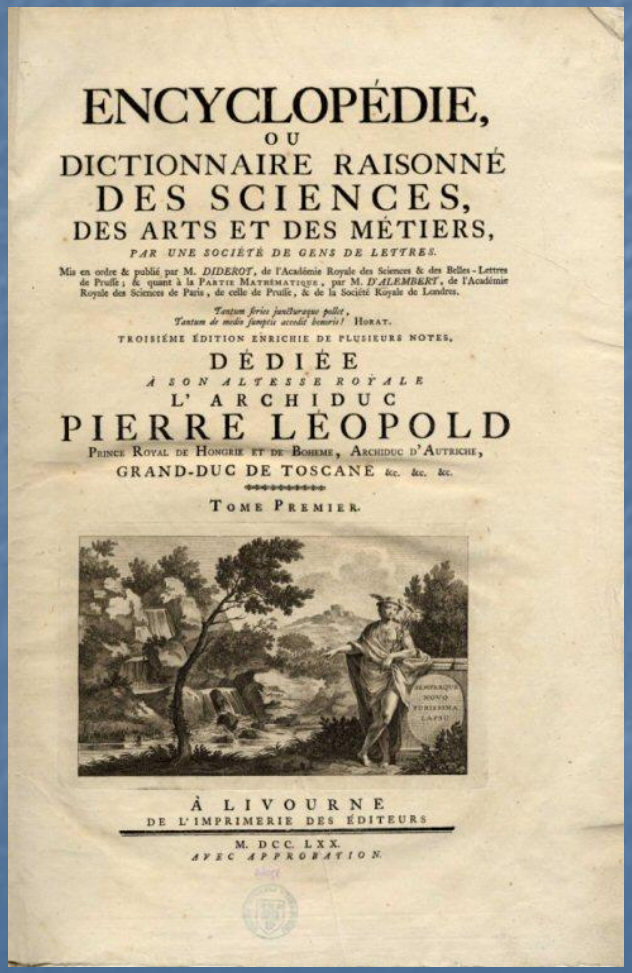
VI. The Role of the Salon

- Protection and encouragement offered by French aristocratic women in their private drawing rooms
- Feminine influence on the Enlightenment
- Madame Geoffrin

VII. Diderot's *Encyclopedia*

- Ultimate strength of the philosophes lay in their numbers, dedication and organization
- Written between 1751-1772
- Attempted to illustrate all human knowledge
- Problems with publication
- Emphasis on practical science

VII. Diderot's *Encyclopedia* (cont)



ENCYCLOPÉDIE,
OU
DICTIONNAIRE RAISONNÉ
DES SCIENCES,
DES ARTS ET DES MÉTIERS,
PAR UNE SOCIÉTÉ DE GENS DE LETTRES.

Mis en ordre & publié par M. DIDEROT, de l'Académie Royale des Sciences & des Belles-Lettres de Prusse; & quant à la Partie Mathématique, par M. D'ALEMBERT, de l'Académie Royale des Sciences de Paris, de celle de Prusse, & de la Société Royale de Londres.

Tantum series juncturaque pollet,
Tantum de medio sumptis accedit honoris! HORAT.

TROISIÈME ÉDITION ENRICHIE DE PLUSIEURS NOTES,

DÉDIÉE
A SON ALTESSE ROYALE
L'ARCHIDUC
PIERRE LÉOPOLD
PRINCE ROYAL DE HONGRIE ET DE BOHEME, ARCHIDUC D'AUTRICHE,
GRAND-DUC DE TOSCANE &c. &c. &c.

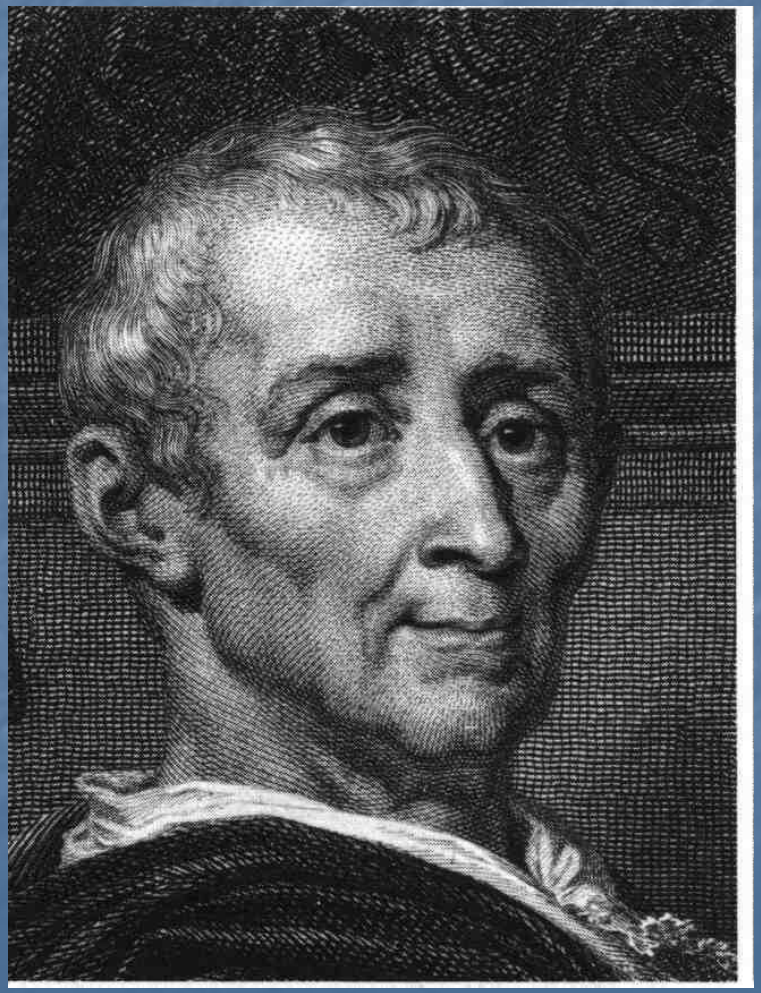
TOME PREMIER.

À LIVOURNE
DE L'IMPRIMERIE DES ÉDITEURS
M. DCC. LXX.
AVEC APPROBATION.

- Desire to change the "general way of thinking"
- Greater knowledge leads to human progress
- Emphasized moderation and tolerance
- Human nature can be molded
- Inalienable rights and the social contract
- Knowledge improves goodness

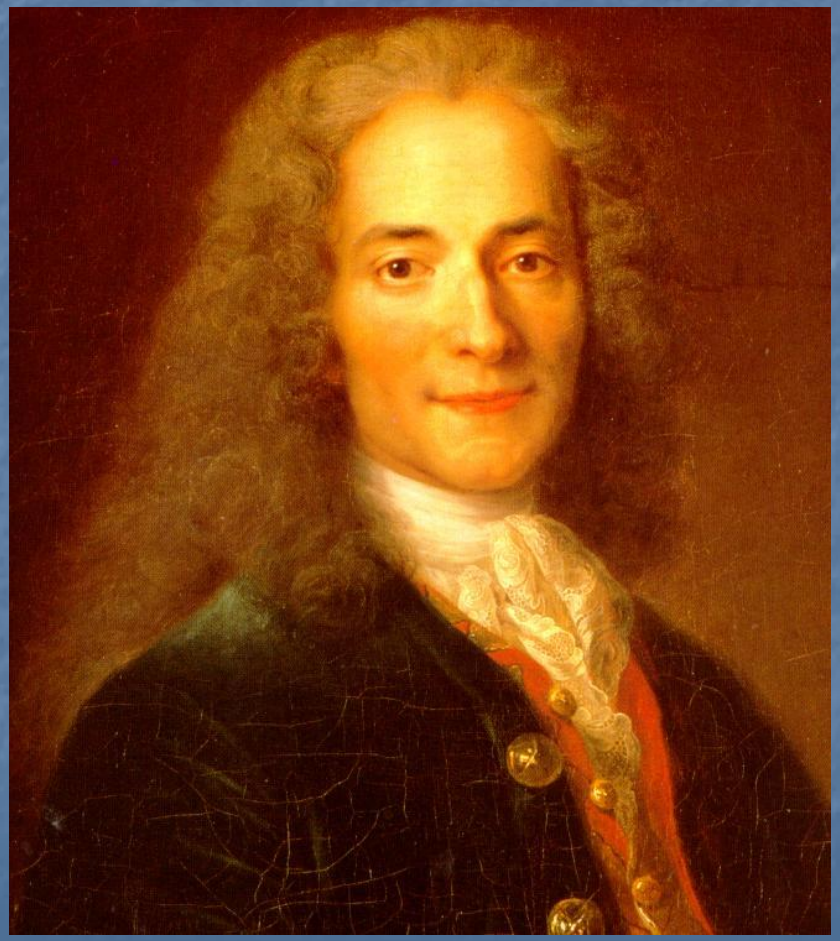
VIII. Famous Enlightenment Thinkers

A. Baron de Montesquieu (1689-1755)



- *The Spirit of the Laws* (1748)
- Despotism could be avoided if political power were divided and shared by a diversity of classes
- Power must check power
- Admires British government
- French parlements must be defenders of liberty
- Influence in the US

B. Voltaire (1694-1778)



- Enthusiasm for English institutions
- Reformer not a revolutionary
- Admirer of Louis XIV
- Relationship with Frederick the Great
- "Ecrasez l'infame"

C. Baron Paul d'Holbach (1723-1789)

- Deterministic view of human beings
- Free will, God and immortality of the soul are foolish myths
- His views dealt the unity of the Enlightenment a severe blow
- Other thinkers repelled by this inflexible atheism

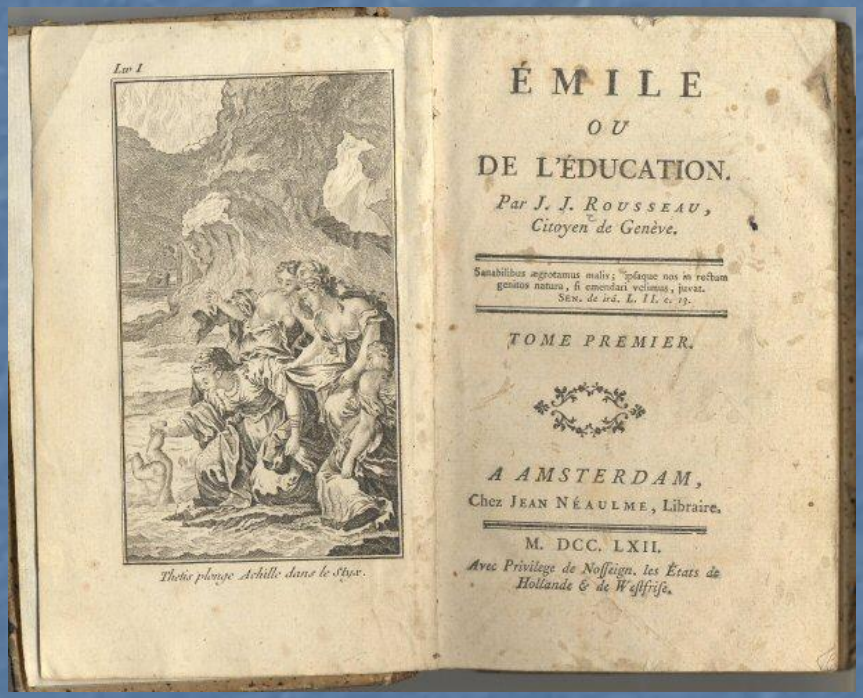
D. David Hume (1711-1776)

- Human mind is nothing but a bundle of impressions
- Reason cannot decipher anything about the origins of the universe or the existence of God
- Hume's rationalistic inquiry results in undermining the Enlightenment confidence in reason itself

E. Jean-Jacques Rousseau (1712-1778)

- His life
- Turns his withering critique of the Old Regime increasingly on the Enlightenment itself
- Rather than liberation, rationalism and civilization destroys the individual
- Man by nature was solitary, good and free

E. Rousseau (cont)


Liv I

Thetis plonge Achille dans le Styx.

ÉMILE

OU

DE L'ÉDUCATION.

Par J. J. ROUSSEAU,
Citoyen de Genève.

Sanabilibus ægrotamus malis; ipsique nos in rectum genitos natura, si emendari velimus, juvat.
SEN. de ira. L. II. c. 13.

TOME PREMIER.

A AMSTERDAM,
Chez JEAN NÉAULME, Libraire.

M. DCC. LXII.
Avec Privilege de Nosseign. les États de Hollande & de Westfrise.

- Civilization represents decay, not progress
- *Emile*—protect children from too many books
- *The Social Contract* (1762) and the "General Will"
- Civilized man is an alienated man
- Transitional intellectual figure

F. Immanuel Kant (1724-1804)

- One of few philosophes to live to see the French Revolution
- Enlightenment was a personal process—release from immaturity
- More optimistic than Rousseau
- "Dare to Know"—Enlightenment was an act of personal courage

IX. Enlightened Despotism

- The manner of political reform
- Frederick the Great of Prussia
- Catherine the Great of Russia
- Joseph II of Austria
- True reform or a cynical, manipulative consolidation of power?