

Chapter 16 Glossary

Antoine Lavoisier: invented a system of naming the chemical elements – many regard him as the father of modern chemistry. His wife Marie-Anne was his collaborator. (1743-1794)

Benedict de Spinoza: Jewish philosopher whose beliefs put him at odds with both Jews and Christians. He believed that God was not simply the creator of the universe, but that God was the universe. (1632-1677)

Blaise Pascal: French scientist who tried to reconcile differences between humanists and science. (1623-1662)

Cartesian Dualism: Descartes believed that a man consisted of (1) matter: The physical stuff that walks, talks, and plays the accordion, and (2) mind: The nonphysical substance (sometimes equated with the soul) that thinks, and doubts.

Christianized Ptolemaic Universe: finite understanding of the universe that had a fixed outer boundary in harmony with Christian thought based on God saving souls at one end of the universe and humans at the center.

Dialogue on the Two Chief World System: Galileo's work that was written in Italian instead of Latin and could thus be disseminated widely, which drew the ire of the Catholic Church, and earned Galileo house arrest for the remaining 8 years of his life.

English Royal Society: evoked out of informal scientific gatherings and formalized by King Charles II in 1662 – remained independent of the government for the most part.

Ethics Demonstrated in the Geometrical Manner: Spinoza's treatise in which he said human beings are not situated in nature as a kingdom within a kingdom, but are as much a part of God or nature or the universal order as other objects.

Francis Bacon: believed that the correct scientific method was to be built on inductive principles, rather than beginning with assumed principles from which logical conclusions could be made – particular to the general. (1561-1626).

French Royal Academy: formally recognized by Louis XIV. Received substantial state support, which allowed the government to control much of its output.

Galen: first-century Greek physician, whose teachings along with Aristotle, dominated Late Medieval scholarship and understanding.

Galileo: first European to make systematic observations with a telescope. In his work *The Starry Messenger*, which demolished traditional cosmology and affirmed the basics of Copernicus's heliocentric theory.

Geocentric Conception: understanding of the universe as a series of concentric spheres with a fixed and motionless earth as its center.

Heliocentric Conception: theory that said the sun, not the earth, was at the center of the universe and the planets revolved around the motionless sun.

Hermetic Magic: fusion of Renaissance magic and alchemy which believed the world was the living embodiment of divinity – the practice and engagement of experimentation set the framework for “experimental philosophy.”

humors: four bodily components (blood, bile, phlegm, black bile) that Galen believed when imbalanced caused disease.

inertia: principle discovered by Galileo that argued a body in motion continues in motion forever unless deflected by an external force.

Johannes Kepler: used the observations of Brahe to arrive at three laws of planetary motion: elliptical orbits, speed of orbits, speed of planetary revolution. (1571-1630).

Journal de Savants: weekly French journal that printed results of experiments as well as general scientific knowledge.

Margaret Cavendish: one of the most prominent female scientists of the 17th century whose experience was typical of the times. There was opportunity for her as a noblewoman, but she was excluded in many circles because she was female. (1623-1673)

Maria Merian: woman who established a reputation as an entomologist, and was quite good and prolific as an illustrator in her father's workshop.

Maria Winkelmann: most famous female astronomer in Germany who was educated by her father and her uncle. She married Gottfried Kirch and became his assistant.

Mathematics: foundation of new thinking in the scientific age and seen as the key to navigation, military science, and geography.

Middle Age World View: cosmological understanding of the world defined by the ideas of Aristotle and Ptolemy based on a geocentric conception of the universe.

natural philosophers: Medieval scientists whose mathematical and physical thinking relied on the works of Aristotle and Galen and fit into a strict theological framework.

Nicolaus Copernicus: Polish mathematician and astronomer whose book “On the Revolutions of the Heavenly Spheres” developed a theory of a heliocentric conception of the universe. (1473-1543)

Paracelsus: rejected the work of Aristotle and Galen in favor of a chemical philosophy in understanding and treating disease – disease was not caused by an imbalance of the humors, rather by a chemical imbalance. (1493-1541)

Pensées: Blaise Pascal’s apology for the Christian religion in which he tried to convert rationalists to Christianity by appealing to both reason and emotion.

querelles des femmes: “The woman question” is a phrase usually used in connection with a social change in the latter half of the 19th century, which questioned the fundamental roles of women in Western industrialized countries.

rationalism: belief that reason and experience must be present for the solution of problems

René Descartes: from a starting point of doubt, his most famous statement was “I think, therefore, I am,” (in Latin, *Cogito ergo sum*) which was the basis accepting things only by reason.

Robert Boyle: one of the first scientists to conduct controlled experiments who pioneered exploration of gases resulting in “Boyle’s Law,” which states the volume of gas varies with pressure exerted on it. (1627-1691)

scientific method: logical, systematic approach to the solution of a scientific problem. The process of gathering evidence to test and refine scientific theories.

Scientific Revolution: historical changes in thought and belief, to changes in social & institutional organization, that unfolded in Europe between roughly 1550-1700

secularization: trend away from a religious understanding of society and man’s role in it as a result of the Scientific Revolution.

Sir Isaac Newton: his book *Principia Mathematica* spelled out the mathematical proofs demonstrating universal laws of gravitation based on three laws of motion. (1643-1727)

systematic observation: Sir Isaac Newton synthesized Bacon’s inductive principles with Descartes deductive principles which allowed general concepts to be tested and verified.

Tycho Brahe: compiled a detailed record of his observations and the positions and movements of the stars and planets, which led him to reject the Aristotelian-Ptolemaic system. (1546-1601)

Vesalius: 16th century anatomist whose work “On the fabric of the Human body” based on personal dissections of bodies led to new understandings of the human body. (1514-1564)

William Harvey: doctor whose reputation rests on his book “On the Motion of the Heart and Blood,” which proved the errors of Galen, and established that the heart, not the liver was the beginning point of blood circulation. (1578-1657)

world machine: Newton’s theory that saw the world largely in mechanistic terms and the universe operated under well regulated and uniform natural laws.