History Lecture Notes

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**Lecture 4: Scientific and Technical Knowledge in Antiquity**

**Key Facts:**

* **Alexandria Museion:** Founded in the 3rd century BC under Ptolemy Philadelphus, included the extensive Library of Alexandria with over 500,000 papyrus scrolls.
* **Eratosthenes:** Applied a coordinate system to the Earth's surface and calculated the Earth's circumference with remarkable accuracy.
* **Aristarchus:** Proposed the first known heliocentric system where Earth and other planets orbit the Sun.
* **Apollonius and Ptolemy:** Developed the theory of epicycles and compiled the Almagest, a significant astronomical manual.
* **Technological Innovations:** Included the Eupalinus tunnel, water lifting devices like the Archimedean screw, and the Antikythera mechanism, an early mechanical computer.
* **Military Technologies:** Ctesibius's machines, water organ, and superweapons of Archimedes.
* **Reasons for No Industrial Revolution:** Lack of natural resources, widespread slave labor, and non-capitalist economy.

**Trends:**

* Emphasis on empirical observation and mathematical principles.
* Significant advancements in astronomy, engineering, and military technology.
* Development of infrastructure and mechanical devices for practical and military applications.

**Lecture 5: Scientific and Technical Knowledge in the Middle Ages in Asia and America**

**Key Facts:**

* **Mesoamerican Civilizations:** Developed advanced agricultural techniques, an elaborate medical pharmacopeia, and the quipu for recording information.
* **Chinese Achievements:** Decimal place-value number system, extensive astronomical records, accurate maps, the Grand Canal, and porcelain.
* **Gunpowder and Printing:** Invention of gunpowder in the 9th century and movable type printing around 1040 revolutionized warfare and communication.
* **Byzantine Science:** John Philopon introduced the concept of "impetus," which influenced later scientific thought.
* **Islamic Science:** Major contributions in various fields including medicine, mathematics, and astronomy, with significant translations of Greek works.

**Trends:**

* Technological and scientific advancements were often tied to practical needs such as agriculture, warfare, and navigation.
* Cross-cultural exchanges, particularly through translation efforts, played a crucial role in the spread of knowledge.

**Lecture 6: Scientific and Technical Knowledge in Medieval Europe**

**Key Facts:**

* **Medieval Periodization:** Early Middle Ages (5-9th centuries), High Middle Ages (10-13th centuries), Late Middle Ages (14-15th centuries).
* **Key Dates:** 476 AD (fall of Western Roman Empire), 1054 AD (division of Catholic and Orthodox churches), 1492 AD (Columbus's discovery of America).
* **Technological Innovations:** Heavy plow, horse collar, three-field rotation system, and water and windmills.
* **First Universities:** Salerno Medical School (9th century), Bologna (1088 AD), Paris (by 1200 AD), Oxford (by 1220 AD).
* **Scientific Method:** Emphasis on experience and observation, as seen in the works of Roger Bacon and Jean Buridan.

**Trends:**

* Revival and growth of learning institutions.
* Technological innovations leading to increased agricultural productivity and demographic growth.
* Development of experimental methods and empirical research.

**Lecture 7: Scientific and Technical Knowledge in Early Modern Time (16-17th Century)**

**Key Facts:**

* **Scientific Revolution:** Marked by figures like Galileo Galilei, Copernicus, and advancements in anatomy and chemistry.
* **Renaissance Humanism:** Renewed interest in antiquity, rejection of scholasticism, and belief in human potential.
* **Printing Revolution:** Gutenberg's invention of the printing press in the late 1430s greatly increased the dissemination of information.
* **Reformation:** Initiated by Martin Luther in 1517, leading to significant religious and cultural shifts.
* **First Scientific Societies:** The Academy of the Mysteries of Nature (1560) and the Royal Society of London (1662).

**Trends:**

* Increased emphasis on observation, experimentation, and empirical evidence.
* Integration of scientific inquiry with broader cultural movements like the Renaissance and Reformation.
* Formation of scientific communities and institutions fostering collaborative research and knowledge dissemination.