



## The Scientific Revolution: Its Classical and Christian History with Dr. Ted Davis

Lecture 9: Rome,  
Alexandria, and  
Baghdad: The  
Reception of Greek  
Natural Philosophy in  
Antiquity and the Early  
Middle Ages

### Outline:

Rome, Alexandria, and Baghdad: The Reception of Greek Natural Philosophy in Antiquity and the Early Middle Ages

- The emperor Constantine, who ruled from 306-337, added a second capitol city to help govern the massive empire.
  - He located this city strategically between Europe and Asia, on the Bosphorus.
  - This city was originally called Constantinople, it was later called Byzantium, capitol of the Byzantine Empire which succeeded the Roman Empire in the East. Byzantium fell to the Turks in 1453, and it was renamed Istanbul
- There were always major differences between the East and the West, even before Constantinople was established.
  - The East was wealthier, more cosmopolitan, and more sophisticated; Greek was the language of the learned (e.g., New Testament).
  - Latin was the language of the learned in the West (e.g., Jerome's Vulgate Bible). Few in the West were literate in Greek. Most could not read the works of Aristotle, Plato, Galen, or Ptolemy—even if they could get their hands on a copy.
  - As a general rule, the Romans were not interested in Greek science; they made no efforts to advance it, seeking only a rudimentary understanding. They put much more value on technology, such as civil and military engineering: roads, bridges, aqueducts, colosseums.
  - Romans usually learned about Greek science second-hand, through Latin encyclopedia versions of Greek scientific ideas rather than by reading the Greek authors themselves. Most famous of these versions was compiled by Gaius Pliny the Elder (23-79), who died observing the eruption of Vesuvius.
  - Pliny was an indefatigable scholar who worked ceaselessly and compiled a very comprehensive and fairly accurate collection of information about Greek art and science. *Naturalis historia*, in 37 “books.” After Pliny, however, it was all downhill for knowledge of



Greek science in the West, as authors got even further from the original sources they were digesting.

- By 500 AD, very few people in the western part of the old empire were literate in Greek. A tiny handful of Latin writers tried to keep Greek works alive by translating them into Latin. Greatest of these was **Boethius** (ca. 480 – 524), **“the last bilingual philosopher of the [Roman] Empire”** (Brian Stock). He is best known for *De consolazione philosophiae* and a book on music theory
  - A great scholar, Boethius hoped to translate all the works of Plato and Aristotle and some other authors into Latin. Before he could finish, however, he was executed by the Ostrogoth emperor Theodoric the Great for political reasons.
    - Boethius managed to translate several works, but some were later lost. His translations of Aristotle’s books on logic did survive. They constituted almost all the works of Aristotle that were available in the West before the 12th century—a poor state of affairs, compared with the East.
    - By 600 AD, owing to Boethius and others, the list of Greek scientific works available in Latin included:
      - Plato, *Timeaus* (Chalcidius’ partial translation)
      - Some of the Hippocratic medical corpus
      - Some of Aristotle’s zoological works
      - Euclid, *Elements* (books XI – XIII)
      - Aristotle’s logical works (Boethius)
      - Only 3 books by Galen, who wrote at least 100 books
- Before the Scientific Revolution could occur—before Greek science could be rejected—it had first to be assimilated. And before it could be assimilated, it had to be recovered from the East and translated into Latin.
- Greek science went down a long and winding road on its way to the Latin West, where it eventually arrived in the 11th and 12th Centuries.
- **In the East**, the story was very different. Alexander the Great, tutored by Aristotle, had taken Greek learning with him across the ancient Near East and Egypt. Hellenistic culture resulted from his conquests. Alexander founded the city of Alexandria in 332 BC as a great port, and it became a great center of learning.
  - The Ptolemaic kings who succeeded Alexander in that part of the world established a Mouseion (“a shrine of the muses,” or Museum) and Library at Alexandria, the greatest library of the age with perhaps as many as 500,000 or even 700,000 volumes, according to various ancient sources—no one knows the exact size, and guesses vary greatly. **It became a great research center, where Archimedes, Euclid, Eratosthenes, and Hipparchus all worked at one time or another.** Much later, in the 2nd C. AD, **Galen** studied medicine at Alexandria and Claudius **Ptolemy** wrote the *Almagest* at the Museum.



- For comparison, the Roman library of Celsus at Ephesus (2nd century AD) held just 12,000 scrolls.
- Over the centuries, however, the library suffered from fire, warfare, civil strife, and budget cuts. In one form or another, it survived until the 7th century AD.
- At around that time, with the rapid spread of Islam in the Middle East and North Africa, Islamic caliphs took over a tradition established by the Sasanian rulers they had conquered: collecting documents and literary works in the palace library in Baghdad—a national archive. Baghdad became the center of the vast empire ruled by the Abbasid Caliphs, who dominated the Near East and North Africa.
  - Many historians have overstated the significance of the palace library at Baghdad, conflating it into an academy (“the House of Wisdom”) that probably never existed; contrary to what is often said, “We have exceedingly little historical information about the bayt al-hikma (library).” —Dmitri Gutas, *Greek Thought, Arabic Culture* (1998), p. 54.
  - Nevertheless, in the 9th century, under the Abbasid caliph AlMa'mun (whose mother was Persian), Islamic scholars began to collect Greek works and have them translated into Arabic, to supplement the Persian, Indian, and other works in the palace library.
  - A crucial role was filled by the Nestorians, a group of Syriac-speaking Christians regarded as heretical by the Roman and Eastern Orthodox churches. They were pushed further eastward by the Byzantines and came into contact with Islamic scholars, especially in Baghdad.
  - The most important person in this context was Hunayn ibn Ishaq (809 - 873), a Nestorian physician who worked as a private contractor.
  - Hunayn and his assistants (including his son and a nephew) were paid handsomely to translate a great number of Greek works into Syriac and/or Arabic:
    - 95 works of Galen, 15 Hippocratic works, and some of Plato and Aristotle. The emphasis on medical works reflects the fact that Hunayn was a physician.
  - In a parallel development, the Ummayyid caliphs in Spain established a learned court at Córdoba, with a library of perhaps 400,000 volumes in the 10th Century. This library was destroyed in 1013 and its holdings were dispersed to other, smaller capitols. Some of them later became available to Christian scholars.
  - In general, Islamic libraries were highly successful—and crucial to the recovery of Greek works in the Latin West. By 1000 AD, “almost the entire corpus of Greek medicine, natural philosophy,



and mathematics” had been translated into Arabic (Lindberg, The Beginnings of Western Science, p. 170)