Hello!

HHS 130 Introduction to History of Science and Technology

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Renaissance Science and Technology in Europe

- McClellan & Dorn, *Science and Technology in World History: An Introduction* (3rd ed.), pp. 223-42.
  - The "Copernican revolution"
    - Catalyzed the processes culminating by 1700 in the Scientific Revolution and the formation of the modern scientific worldview
    - Heliocentrism
      - As opposed to the geocentric models of Aristotle and Ptolemy
      - Stellar parallax and stations/retrogradations

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- The Scientific Revolution: occurred during 16th and 17th centuries, periodized as such in the 20th century
  - Experimental method
  - Ideological support for utilitarian science

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- Developments:
  - Military technology
  - Geography
  - Printing
  - Anatomy
  - Urbanism
  - Secularism
  - Architecture
  - Art
  - Magic and occult sciences
  - Calendar reform

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- Further questions of method:
  - P. 223: “As scholars have delved deeper into the subject, the unquestioned unity and reality of *the* Scientific Revolution or a Scientific Revolution began to break down. The Scientific Revolution as simply an episode in the history of scientific ideas is long a thing of the past. For example, any treatment of the Scientific Revolution must now address not just a triumphant astronomy or mechanics but the ‘occult’ sciences of magic, alchemy, and astrology.”

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- Further questions of method:
  - P. 224: “The current interpretative stance rejects any simple notion of the Scientific Revolution as a unitary event with clearly defined chronological or conceptual boundaries. Historians now tend to treat the Scientific Revolution as a useful conceptual tool, setting the episode in a broader historical context as a complex and multifaceted phenomenon to be studied through a variety of approaches.”

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- Further questions of method:
  - P. 225: “So noteworthy was [Brunelleschi’s dome in Florence] that historians have been inclined to place Renaissance artists at the vanguard of those uncovering new knowledge about nature in the fifteenth and sixteenth centuries. Whatever one may make of that claim, early modern artists needed accurate knowledge of human muscular anatomy for lifelike renditions, and an explosion of anatomical research in the Renaissance may be attributed to this need in the artistic community.”

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- Further questions of method:
  - P. 233: “The phenomenon of stellar parallax is in fact a very subtle one, never observable in naked-eye astronomy and not actually demonstrated until 1838. The discovery of stellar aberration by the English Astronomer Royal, James Bradley, in 1729 demonstrated the earth’s annual motion but, amazingly, only in 1851 did the physicist J. B. L. Foucault definitively prove the daily rotation of the earth by using a giant pendulum. By the eighteenth and nineteenth centuries Ptolemaic astronomy had all but ceased to exist; by that time astronomers universally held to the earth’s diurnal motion and to heliocentrism. Can it be that such definitive proofs are not what is needed to persuade converts to a new science?”

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- Further questions of method:
  - P. 234: “A revolution in astronomy is barely discernible even in the second half of the sixteenth century. Not an abrupt transformation of contemporary astronomy or of worldview, the Copernican revolution was, at most, a revolution by degrees.”
  - P. 237: “The case of Johannes Kepler (1571-1630) belies the notion that the internal logic of scientific discovery alone suffices to account for scientific change.”

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- Further questions of method:
  - P. 239: ‘Kepler’s *Mysterium* was the first overtly Copernican work since *De revolutionibus* more than a half a century before, and its origin in pedagogy is one of a handful of exceptions proving the historical rule that nothing of importance for science ever happens in classrooms.”

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- Further questions of method:
  - P. 242: “Kepler died of a fever in 1630 while traveling to petition for money owed him. Although he contributed to it mightily, Kepler did not culminate the Scientific Revolution. We extract Kepler’s three laws all too easily from the corpus of his work because we know their historical role and significance for later science, but contemporaries did not and could not. Few astronomers actually read his works, and by and large Kepler did not win converts. Indeed, most scientists who became aware of Kepler’s work, notably his great contemporary, Galileo, rejected his views. As an eccentric mystic, Kepler enjoyed the reputation, rather, of a great astronomer gone slightly mad.”