

Koestler, The Watershed (pp. 384-503)

1. What kind of relationship did Kepler have with Galileo? Did he support Galileo? Did Galileo support him?
2. What was the evidence that Kepler's mother was a witch (389ff)? What work did Kepler complete whilst defending his mother?
3. In what sense was Kepler's *Harmony of the World* the culmination of his life's work (394)? What is Pythagorean about it? How does he find his "Third" Law?
4. What was the significance of Galileo's *Letter to the Grand Duchess Christina*?
5. How did Cardinal Bellarmine place the burden of proof of the Copernican system back onto Galileo (455)? What do you think would have happened if Galileo had accepted Bellarmine's advice instead of contesting it?
6. Why couldn't Galileo have refuted Aristotelian cosmology by simply appealing to the empirical evidence (novae, comets, sunspots, etc.)?
7. What was Galileo's "proof of the Copernican theory" and what ironies are there in this episode for his relations with Kepler (460 ff, 471 ff)? Do you think Koestler's analysis of the fallacy of Galileo's reasoning is correct?
8. What were Galileo's relations with Pope Urban (Maffeo Barberini) (478 ff)? Did the Church set out to break Galileo at his trial?

Lindberg (ch. 8, pp. 313-320)

1. Why do you think al-Kindi takes the radiation of light to be incoherent? How does Alhacen construct an account of coherent visual perception on this basis?
2. When, where and how did Alhacen's influence make itself felt in Europe?
3. What theories did Kepler have access to?

Bala (ch. 8, pp. 85-94)

1. Why does Bala take issue with Kuhn's claim that the science of optics did not achieve paradigm status until Newton reformed it? What features of Alhazen's theory may be found presupposed by Newton and others?
2. What other aspects of Alhazen's work were influential on the development of modern science?
3. What shift in the sensibilities of Europeans can be attributed to the influence of Alhazen's work?
4. Why does Bala think Alhazen's optical revolution did not have a comparable effect on Muslim thought?