Reading Questions for Sept. 17-19 and 24-26

These questions are intended to orient you in the reading. You do not need to have definite answers to them, but you should think about them.

Note: some of the questions are focused on specific passages from the readings. You should still do the rest of the reading! Read the whole assignment quickly, and then return to the questions.

Tues. 9/17: Agricultural hydraulics: The foundation of civilization
Read: McClellan/Dorn, 31-54 (chapter 3).

1. What is the “hydraulic hypothesis”? How does it explain the origins of civilization (stratified, urbanized societies) in different parts of the world? Why did archeologists originally think that Mayan civilization provided a challenge to the hydraulic hypothesis?

2. Why does irrigation agriculture require more complex social organization than agriculture without irrigation?

3. In what ways did civilized societies encourage the development of science (for example, astronomy)? What needs did civilization create that could be met by science?

Thurs. 9/19: Writing, technology, and the social order
NO READING TODAY. (You might want to get a start on next week’s readings; the selections from Aristotle will be demanding.)

1. Review McClellan/Dorn, 45-49. What artifacts were required for writing in ancient Mesopotamia—that is, what was the material technology of writing? What skills were required?

2. Why was writing advantageous in early civilizations? Do you think that writing is necessary for the existence of complex, differentiated societies? (Hint: think about the Inca Empire—see pp. 164-167.)

Tues. 9/24: Greek science, technology, and society
Read: McClellan/Dorn, 55-95 (chapter 4).

1. On p. 57, McClellan and Dorn call Greece a “secondary civilization.” What does that term mean? How do the size and political organization of ancient Greek states compare with the “primary civilizations” in ancient Mesopotamia and Egypt?

2. Read pp. 66-68 on Plato’s cosmological ideas. Why did Plato assume that the heavens moved in perfect circles? Why did the behavior of the planets pose a challenge to this assumption? What role did this dissonance between theory and observation play in the development of Greek planetary theory?

3. Now read pp. 68-71. How did Eudoxus of Cnidus and his successors attempt to explain planetary motion? Why was their approach unsuccessful? Note that they used a model of nesting spheres. Now turn to the bottom of p. 81 (beginning with “In astronomy) and read to p. 85. How did Ptolemy eventually solve the problem of planetary motion? How does his use of eccentrics, epicycles, and equant points compare with Eudoxus’s “onion skin” model? Could you reconcile the two?

4. Read pp. 71-78. How does Aristotle’s view of terrestrial physics account for everyday experience (for example, trying to submerge an air-filled balloon)? Why did Aristotle believe that the planets and the fixed stars obey different physical laws than things below the sphere of the moon?
5. Who supported the investigations of Hellenic natural philosophers (from the Ionians like Thales through Aristotle)? How does their social position compare with that of Hellenistic natural philosophers, such as the scholars at the Museum and Library of Alexandria?

6. Read pp. 85-95. How was technology related to science in the ancient world? Why weren’t ancient Greeks and Romans interested in machine power and labor-saving technologies?

**Thurs. 9/26: Greek scientific method**

Read: Aristotle, 16-30, 196-216, 275-282 (selections from Posterior Analytics, Nicomachean Ethics)

Aristotle is a challenging writer. Many of his extant works may actually be his (or even his students’) lecture notes; whatever their source, they are often extremely cryptic. Compounding the difficulty, Aristotle thought in ways that are very different from our own. The following instructions and questions should help you understand these difficult texts.

**Posterior Analytics**

1. Read the first two paragraphs on p. 18. Aristotle says that “we know a thing without qualification” if three conditions are met. What are they? (Hint: the answer is in the first sentence.)

2. Aristotle thinks that true knowledge has the form of a demonstration: that is, it is a necessary conclusion from universal premisses. Read the last paragraph on p. 18 (which continues on p. 19). Why does Aristotle distinguish two senses of “what is prior and better known”?

3. Is all knowledge demonstrable, according to Aristotle? Read book 1, chapter 3 (20-22). Demonstrable knowledge is necessary: that is, it must be the case. (For example, the angles of a triangle must add up to 180° no matter what the triangle.) What is the status of knowledge that is not demonstrable? Now skip to chapter 9, pp. 26-27. When does the investigator have to make assumptions? Now read chapter 10, pp. 27-28. What are the two kinds of definitions?

4. Read book 2, chapter 19 (28-30). Here Aristotle poses a problem: if demonstration relies on principles that are not prior and better known to us than sensory perception, how is it that we can know those principles? He considers two possibilities. (1) The principles are already in us somehow. This he dismisses as absurd, because then we would not need knowledge by demonstration. (2) We do not have the principles in us, but we are capable of learning them (or, as Aristotle put it, “we must have some <suitable> potentiality”). What role does experience play in this process?

**Nicomachean Ethics**

5. Read book 1, chapters 1-2 (196-197). Why is political science the most important kind of knowledge?

6. Read book 1, chapter 5 (200-201). Aristotle poses three kinds of life where he will try to identify what human happiness is: the life of pleasure, the life of political activity, and the life of study. Why does he eliminate the latter two? Are you convinced? Now skip to chapter 9 (209-211). Why does Aristotle conclude that happiness is possible only for humans?

7. Read book 10, chapters 6-7 (275-279). Why does Aristotle deny that amusement is the source of happiness? Why does he claim that understanding is the source of the greatest happiness? Observe that for Aristotle, something that is done for its own sake is better than something done for the sake of another thing. This principle may help you follow his argument here.

8. Read chapter 8 (279-282). What are the gods like, and what kind of human being most closely resembles them? Do you think Aristotle would place greater value on the life of the philosopher or the life of the artisan (craftsman)?