

Lecture 4: Hippocratic Writers and Ancient Atomists

HIPPOCRATIC WRITINGS

The texts of the so-called "Hippocratic Corpus." Written by several different authors; probably none were actually written by Hippocrates himself. When the collection of texts was assembled, it was named after him. The dates and style vary considerably: some texts are from the late 5th century, while others are probably as recent as the 3rd century. There are some specialized works on particular topics (such as fractures), some observational case-histories or records, and some material addressed to a more public audience.

Physicians and medicine in 4th century BCE. Medicine was already well advanced in other parts of the ancient world much earlier; the *Edwin Smith papyrus* from ancient Egypt dates from about 1600 BC, and is (almost) free of any reference to magic or gods. Being a physician in ancient Greece was not like the modern profession of medicine. Doctors had no formal legal, recognized qualifications or certifications. Anyone could claim to be a doctor, and it appears that there were lots of charlatans and quack doctors. The knowledge of medicine was transmitted via something like an apprenticeship system. Doctors usually practiced privately, and they traveled from town to town. The lack of formal certification combined with an itinerant lifestyle meant that the ancient doctor often had to inspire the confidence of prospective patients/ clients. Also, the training and lifestyle of ancient physicians differed greatly from those of philosophers like Plato and Aristotle.

The "four humors." There was a widespread (though not universal) belief in ancient Greece that humans had four kinds of vital fluids -- or 'humors' -- within them. These four were blood, phlegm, yellow bile, and black bile. Each of the four had distinct characteristics:

- ~ Phlegm is cold and wet
- ~ Black bile is cold and dry
- ~ Yellow Bile is hot and dry
- ~ Blood is hot and wet

Through these characteristics, each of the four humors is associated with one of the four elements, and also with one of the four seasons:

- ~ Phlegm: Winter, Water
- ~ Black bile: Autumn, Earth
- ~ Yellow Bile: Summer, Fire
- ~ Blood: Spring, Air

Airs, Waters, Places

What is the foundation of medical knowledge? Modern doctors begin their diagnosis of a patient by finding out particular information about that individual patient, and using that information to determine what the patient's problem is. The author of *Airs, Waters, Places* offers a different answer. He suggests

that the physician begin by knowing:

1. The effects of each of the 4 seasons on health
2. The effects of the winds (e.g., from the north vs. from the south)
3. The effects of different kinds of water
4. The eating and drinking habits of the town's residents

In short, the author of *Airs, Waters, Places* focuses primarily upon the patient's *environment* in order to determine what the patient's problem is, as opposed to the individual characteristics/ symptoms the patient is showing.

These things are especially valuable to know because they will allow the physician to make *predictions* -- if you know that a certain disease is associated with a particular season or a particular wind, then when that season or wind comes, the doctor will know what steps to tell his patients to take, in order to avoid having that particular disease.

Astronomy and medicine. We today think of astronomy and medicine as very different. But the author of *AWP* says "astronomy contributes... a very great deal to medicine. For with the seasons the organs of people undergo a change." In particular, our bodies are most vulnerable at the change of seasons, as the organs and fluids in our body are changing from one relatively steady state to another. This is why the author says that the solstices and the equinoxes are the dangerous times for human health, and that risky medical procedures should not be performed around these 4 days. (There are 2 solstices per year: one is the day we change from fall to winter, and the other from spring to summer. There are also two equinoxes: one is the day we change from winter to spring, the other from summer to fall.)

The Sacred Disease

We think the disease here is epilepsy. The author attacks the idea that the disease is caused by specifically divine influences.

Attacks on physicians who call the disease 'sacred.'

1. Why is the disease considered sacred? Bad doctors who couldn't figure out how to cure it excused their inability by calling the disease divine. These poor doctors also pretend to have secret knowledge that the uninitiated lack.
2. The Author claims that those who think the disease is divine are impious themselves, for they think they are stronger/ more powerful than the gods, who can be made to act however the witch-doctor wants them to: "The divine power has been overcome and forced into subjection by the human will". Also, a god would not pollute a human body, since that is a evil, nasty thing to do; if a god were in someone, it would "purify and sanctify" the body.

Arguments against the disease being sacred.

1. Against the view that contact with goats, supposedly unholy animals, causes the disease: (a) Libyans eat goat all the time, make their clothes out of goats, and sleep on goatskin blankets -- but they do not appear to suffer from the disease any more than anyone else. (b) Assume for a moment that eating goat *did* increase the likelihood one catches the disease. The author argues that even this would not prove that

the disease was divinely caused. "But if these things [=goats], when administered in food, aggravate the disease, and if it be cured by abstinence from them, godhead is not the cause at all; nor will purifications be of any avail, but it is the food which is beneficial and prejudicial." Principle of causal/ ontological economy: no double causation.

2. This disease, like many others, is hereditary and has physical causes. People who are phlegmatic often get it, whereas bilious people never do. But "if its origin were divine, all types would be affected alike". This is another argument using causal reasoning; the principle is: if a given factor is irrelevant to bringing about the effect in question, then the effect should occur equally often in cases where the effect is present, and where it is not. So if the gods, and not physical fluids, were the cause, then there should be no correlation between fluids and the disease.

The disease is a result of a physical malfunction in the brain. If phlegm in the brain cannot take the normal route out of the brain, the vessels that distribute air to our bodies get filled with this phlegm. This blockage causes the fit. Sudden changes in the weather and the winds bring on attacks.

Evidence for this account of the disease: animal dissection. Goats are liable to the disease, and if you cut open a sick goat's head, "the brain is wet, full of fluid and foul-smelling".

The author claims that the brain is the seat of perception and thinking (248). But this was not a universally shared opinion; many people, including Aristotle, thought the heart was the source of perception and judgment.

ANCIENT ATOMISTS

Biographies. The texts of two Presocratic atomists, Leucippus and Democritus, have survived. Democritus set forth the fundamental doctrines of atomism: all that exists is atoms in the void, and atoms are eternal and unchangeable bits of matter whose basic characteristics are shape, size, and weight. So Plato and Aristotle knew about atomist ideas. However, the atomist we read, Epicurus, was writing shortly after Aristotle (341-270 BC). Like Plato, he was an Athenian. He was a voluminous writer, but we only have three summary letters, and some fragments and maxims. We also read a short text from Cicero, the famous Roman statesman, but he is not a dedicated atomist himself; rather, he wrote works examining and comparing various schools of philosophical thought.

The meaning of the Greek word *atoma*. We today think of atoms as having distinct, separate parts: protons, electrons, and neutrons. That would (literally) be nonsense to an Ancient Greek. The Greek *atoma* means 'uncuttable thing' (from *a*=not and *tomein*=to cut). So if you could travel back in time, and you told an ancient Greek that we had 'split the atom,' she or he would look at you like you had just said 'we can make square circles.'

Why study nature? Recall that Plato thinks we should study nature because nature was created by a being that is far more ethical and intelligent than we are. Epicurus writes: "I recommend constant activity in the study of nature; and with this activity more than any other I bring calm or peace to my

life" (p.5). By stressing the explanatory power of the idea that all that exists is atoms in the void, we can overcome our fear of death. And by understanding the physical causes of strange natural occurrences (like eclipses), we can overcome fears that the gods send such things as bad omens. Thus, the aim of philosophy is happiness. The way to achieve happiness was to eliminate fear of the unknown and supernatural. Natural philosophy (i.e. science) is subordinated to ethics. We see this also on p.14: "it is the job of physics to work out precisely the cause of the most important things, and that blessedness [or 'the happy life'] lies in this part of meteorological knowledge

The fundamental constituents of the universe do not come into or pass out of existence. Epicurus holds that the things that *really* exist neither come into existence nor pass out of existence. (In modern terms, we might say the fundamental beings are 'conserved.')

The argument proceeds in two parts:
1. "Nothing comes into being from what is not; for [in that case] everything would be coming into existence out of everything, with no need for seeds." What does that mean?

Suppose for the sake of contradiction that something could come into existence out of nothing. Then we could see cats, chickens, and trees just popping into existence out of nowhere. But we don't see that; rather, we only ever see cats come from cats, chickens from chickens, and trees from trees -- this is what Epicurus means by the 'need for seeds.'

2. "if that which disappears were destroyed into what is not, all things would have been destroyed, since that into which they were dissolved does not exist." That simply means that if the fundamental constituents of the universe really did pass out of existence completely, then there would soon be nothing at all left in the universe -- and as we can see, the universe is still here around us. (If you reply: "But perhaps every time one fundamental entity passes out of existence, another new one comes into existence," then Epicurus will remind you of the argument for 1.: something can't come into existence from nothing.)

What exists? Bodies and void. In Epicurus's words: "The totality is [made up of] bodies and void." [Note: "body" = that which is (i) extended and (ii) offers resistance to touch ('tangible'); "void" = that which (i) is extended but (ii) does NOT offer resistance to touch ('intangible'). Sometimes Epicurus calls atoms 'Full' and void 'Empty.']

What is the argument?

1. "That bodies exist is universally witnessed by sensation itself." That is, we can see and touch bodies.
2. If void did not exist, then the bodies would have no place to move. But we see bodies moving. Thus void exists.
3. Nothing else exists, because "Beyond these two things [viz. body and void] nothing can be conceived, either by a comprehensive grasp or analogously to things so grasped, ... as completely complete natures rather than what are termed properties or accidents of these [two] things." That is, anything else that you might think exists (e.g., colors, temperature, kittens) is dependent upon the existence of bodies (and the fundamental characteristics of bodies). Another way to make this point: Everything is either extended and or not extended. If something is extended, then it is a body; if it is not extended, then it is void -- by the definitions of 'body' and 'void'. There no 'third option.'

Epicurus's epistemology (theory of knowledge) is exhibited in the above argument as well. Sensation is to be the judge of any claim about the visible/ perceptual realm, and reason is to be the judge of claims

concerning the "non-evident," i.e., the invisible realm. We see examples of each kind of judgment here. Bodies exist because our senses say they do. And the existence of void or place is justified by reason in tandem with the perception that motion takes place, since we cannot see or touch the void (void is true, total emptiness, a "vacuum" in modern language, so air is not void).

Further evidence that void exists besides "Motion is impossible without void" (note: these are not in the assigned reading):

1. Bodies that appear solid are actually porous (e.g. water falls through cave walls).
2. Objects can be the same size and shape but weigh different amounts; different relative densities entails that one must have more space in it than the other, heavier one.

Argument that the fundamental constituents of bodies must be atomic (=uncuttable). It is difficult to make this argument look good.

1. From earlier, we know that the fundamental entities of the universe cannot be destroyed into what is not."
2. If the fundamental constituents of bodies are cuttable and changable, then they "could be destroyed into not being" (top of p.6). (See also bot. 8: "it is necessary that during the dissolution of compounds something should remain solid and undissolved, which will guarantee that the changes are not into what is not nor from what is not.") That claim seems dubious to me; perhaps what Epicurus has in mind is that if the atoms are cut and changed over and over again, they will eventually be ground down into nearly nothing -- and perhaps he thinks that eventually they would just pass out of existence completely.

Another argument that the fundamental constituents of bodies are atomic. Recall from above that Epicurus thinks it is important to explain why fish come from fish, dogs come from dogs, but no fish from dogs. He thinks that if the fundamental constituents of bodies were changeable and cuttable, then we wouldn't see generation after generation of animals all the same -- for if the grandchildren are composed of very different entities than the grandparents, then it seems like the grandchildren would *look* very different... which they don't.

Properties of the universe ('the totality'). There are an infinite number of atoms, space extends out infinitely in all directions (contra Aristotle and Plato), and the universe is eternal (contra Plato, pro Aristotle). There are unimaginably many shapes/ kinds of atoms, but the number of different shapes is finite (otherwise there would be large, visible atoms). The atoms are always in continuous motion.

Perception. How do we see things, in atomistic terms? Extremely thin 'films' of atoms come off the surface of objects, and strike our eyes. Hearing and smelling are similar.

Secondary attributes. Like all the philosophers we have read so far, Epicurus has definite views about what is ontologically basic and what is derivative. The only fundamental substances are atoms and void (though void is a strange kind of substance; it is nothing). Now, the fundamental substances have certain "fixed" or "permanent" attributes (attributes that cannot be removed without destroying the substance, e. g., fire is hot): all body is touchable, has some shape, has some size, and has some weight. All other

attributes of body are accidental (e.g., being part of a book or a table are accidental (coincidental, inessential) attributes of the atoms that comprise the book or table).

Gods. The evidence that gods exist is that virtually all cultures everywhere have some belief in gods. Virtually all people think of the gods as "immortal and blessed." From this, we can infer that the gods do not feel angry or thankful or jealous, because if you are subject to these emotional highs and lows, you are not living a thoroughly blessed existence. Therefore, we do not need to worry about the gods becoming angry with us, or about whether or not we perform the appropriate sacrifices or rituals -- their existence is too blessed and excellent to be bothered about such matters. So we do not need to fear the gods' anger.

Another reason to think gods do not control the physical universe: it would be a lot of work to spin the cosmos and the planets around; if gods' existences are supremely blessed, then they wouldn't have a lot of hard work to do (p.41). This takes us back to the first point about Epicurus: delivering us from fear of gods' vengeance.