Lecture Notes: Descartes' *The World* and *Treatise on Man*

Preliminaries: Descartes' method and background

What do we *really* know?
~ *Method of doubt*: Descartes, in his *Meditations on First Philosophy*, intentionally attempts to throw all our so-called knowledge into doubt, so that he can start over from the beginning. He wants to create a new system of knowledge built upon things he knows for certain. So he even doubts that the external world really exists.
~ *The cogito*: Descartes says "the first thing we come to know when we philosophize in an orderly way" [i.e., when we begin by doubting all our pre-existing knowledge] is **one's own existence**. This is the idea behind "*cogito ergo sum*" [I think therefore I am]: even if I throw everything into doubt, I cannot also doubt my own existence at the same time, because there has to be something doing the doubting -- and that something is me. In other words, in order for doubting (a kind of thinking) to happen, there must be a doubt**er**; thus I, the doubter, must exist.

Mind and body.
~ *Mind and body are distinct substances*: But the cogito argument also shows, according to Descartes, that my mind is distinct from my body. Why? Because although I cannot coherently doubt my own existence, I can still coherently doubt that I have the physical body I think I have. That is, thinking can be imagined independently of body: there's nothing in the act of thinking that is necessarily tied to existing in three spatial dimensions.
~ *The 'essences' of mind and body*: for Descartes, the essence of mind is thinking, and the essence of body is extension (i.e., having a determinate 3-D size and shape). Why? As just mentioned, we can imagine everything stripped away from a mind EXCEPT thinking, and the mind would still be a mind -- though if we also removing its power to think, it would no longer count as a mind. Similarly with body (or matter): we can imagine stripping away color, texture, smell, temperature, and other traits from a body and the thing remaining a body -- however, if something is extension-less, it is not a body. (Minds, for Descartes, exist but are extension-less.) Finally, Descartes thinks there are no other kinds of substances besides body and mind (except God).

Biography and our texts. Descartes (1596-1650) was a Frenchman interested in many branches of science, mathematics, and theoretical philosophy. He was given a very Aristotelian education. Like Kepler and Galileo, he studied and wrote on optics, harmonics, and astronomy. His innovation that has most fully permeated our present world is the creation of algebraic geometry -- hence the 'Cartesian coordinates' that we learn about in high school. Unlike Kepler, Galileo, and Copernicus, he was a strictly *philosophical* innovator as well. The texts we read, *The World* and *Treatise on Man*, were composed as parts of a single work during 1629-1633. After Descartes heard of Galileo's condemnation by the church, Descartes decided not to publish this work. These two pieces were published after Descartes died, in the 1660s.

The World

Ch.1: Sensory qualities are very different from the objects which produce them.. Descartes makes a preliminary, general point here: there is a gap between our sensations associated with a certain thing, and what that thing is *really* like. As examples, Descartes mentions that there is no reason to believe that there is something in a feather that is (or resembles) the quality of ticklishness, or that a needle somehow has in it the pain that we feel when we prick our skin with it. Similarly, Descartes suggests, there's no reason to think that the idea of red that we have actually resembles anything "out there" in the apple or in the stop sign.

Ch.2: What is fire? Here we use Descartes' 'stripping-away' style of argument again, which we already saw in the case of mind and body. Fire's destructive powers will remain if we imagine all other qualities stripped away EXCEPT "some power that violently moves the smaller parts and separates them from the bigger ones." So, Descartes infers, fire must contain very small parts, moving with a fast and violent motion.
~ This explains why fire is hot: any 'fast and violent motion' on the parts of our skin creates heat -- just as rubbing our hands together creates heat.
~ Descartes also says that fire does not have any particular direction that it always wants to move in; rather, it simply moves in whichever direction the surrounding bodies make it most easy for the fire to move. So the Aristotelian notion of the natural motion of fire being upwards is thrown out: fire can (and does) move in all directions, but most of it moves mostly upwards because the surrounding particles prevent it from moving in other directions.

Ch.3: Explaining hardness and liquidity. Solid or hard objects are those whose parts are close together and not moving away from each other. (The less distance there is between any two bits of earth in a clump of dirt, the harder that clump will be.) Specifically, we need not assume there is anything glue-like or attractive holding the bits together. If, on the contrary, the parts are moving away from each other quickly, then that stuff will be liquid (and the faster they move away, the more liquid the stuff will be). Note that on this definition, air and fire will both be liquids.

Ch.4: No vacuum. Descartes believes there is no (completely) empty space anywhere in nature. One type of phenomenon that leads him to this idea: you've probably taken a drinking straw, filled it with liquid, and put your finger over the top hole of the straw. The liquid stays up in the straw. Why? Because if it fell, it would create a void or vacuum in the space between your finger and the top of the liquid.
~ But if you remember the basic ideas of the Greek atomists from week 4, they would ask Descartes: "How is motion possible, if there is no empty space, i.e., no room for movement? Descartes' answer: circular replacement. Whenever a body moves, a whole bunch of bodies surrounding it move, and these individual movements form a chain from the spot the moving body just moved into to the spot it just moved out of. Descartes' evidence for this claim is that fish can swim very fast -- so what must be happening is the water they are pushing out of the way in front of them is coming around and pushing them along from behind.

Ch.5: The Elements. In Ch.4, Descartes claimed that "all bodies, both hard and liquid, are composed of the same matter" -- that is, there is no difference in density (or any other quality) between two completely full bodies. So what separates the various elements from one another must be something else. That something else will be shape, size, and speed.
~ Descartes says there are 3 elements:
- Fire: its parts are smallest and fastest, and they can change shape.
- Air: its parts are of middling size and shape, and they are spheres.
- Earth: its parts are largest and slowest-moving.
~ The Aristotelian categories of hot-cold and wet-dry are not basic for Descartes: he wants to explain them in terms of matter in motion.
~ The cosmic structure follows the elemental structure:
- Fire makes up the Sun and the fixed stars
- Air makes up the "heavens" (i.e., everything in the celestial realm between the planets, stars, comets, etc.)
- Earth makes up the planets and the comets
Here on the surface of planet Earth, we find mixed substances -- but very few other places in the universe have mixed substances.

Ch.6 (and end of 5): the "fable." Descartes stops talking about our world; he tells us he will describe a "wholly new" world, that we are to imagine.
~ In this world, everything is understandable: "there is absolutely nothing that anyone cannot know as perfectly as possible." As a result, there are no qualities of things in this imagined world besides (uniformly filled) shape, size, and motion.
~ God gives an initial motion to each portion of matter, lays down laws of motion that govern all subsequent motions, and does nothing else.
~ However, this is not **merely** a fable: Descartes says that, in this imagined world, "one will be able to see... all the things, both general and particular, that appear in this true world."

Ch.7: 3 Laws of Nature.
1st Law: "each individual part of matter always continues to remain in the same state unless collision with others constrains it to change that state."
- This is a big break from both Aristotle and Kepler, for Descartes does not claim that all bodies naturally come to rest.
- This is different from the modern law of inertia ('a body in motion will stay in motion etc.'), because Descartes means it to apply to ALL characteristics, not just velocity. That is, the body's state includes all its properties, not just velocity.

2nd Law: Conservation of total quantity of motion. "when one of these bodies pushes another, it cannot give the other any motion except by losing as much of it own at the same time." For Descartes, the quantity of motion is the volume of the body times its speed.
- This explains why a ball thrown at an immobile wall bounces back to us at (roughly) the same speed.
- This also explains why moving bodies near the surface of the Earth tend to come to rest: the moving body's quantity of motion is being lost to the surrounding air.

Note: laws 1 and 2 are derived from God's immutability: "Acting always in the same way, he always produces the same effect."

3rd Law: all motion tends to be in a straight line. "when a body is moving, ... each of its individual parts tends always to continue its motion along a straight line." This explains why a ball slung around in a sling moves in a straight line when released, instead of continuing to move circularly.
~ Note that this applies to **celestial motions** as well -- planets tend to move in straight lines too.

Ch.8: Formation of the Cosmos.
~ When God set matter in motion, circular motions must have been developed, because there is no void (recall Ch.4).
~ Bigger objects settled into bigger circles, because bigger objects have (all other things being equal) a greater quantity of motion -- which tends to move in a straight line. And bigger circles are 'closer' to straight lines than smaller circles.
~ The sun/ star at the center of each vortex helps spin the surrounding bodies, so the closer a body is to the sun, the faster it will move (all other things being equal).

Ch. 10: Planets.
~ Why do planets spin on thir axes? The bits of heaven (=pure air element) just 'behind' the planet that push it along its orbit are moving faster than the planet. Because of the difference in speeds, the bits of heaven are deflected -- but they are all deflected in one direction. Because they are all deflected in one direction, the planet spins in this direction. This also explains why planets have **moons**: as all the deflected bits of heaven swirl around the planet, they create a 'mini-vortex' (or as Descartes calls it, a "little heaven"). Any solid bodies that get caught up in this mini-vortex become moons.

Ch.11: Weight. What causes heavy bodies to fall? Again, we'll need an explanation purely in terms of bodies in motion running into each other. The basic idea is that because the Earth is spinning, bodies will tend to fly away from it, just as anything placed on a spinning top will fly away from it. But the parts of air have a greater tendency to move away from the planet than the parts of earth. So, in effect, the air parts will 'push down' on any chunk of earthy stuff that is raised up off the Earth's surface, but only because the earthy stuff's upward force is less than the airy stuff's upward force.

Ch.15: the imagined world will, to its inhabitants, look and behave exactly like our world looks to us.

Treatise on Man

The main point is found in the final paragraph: we can account for the vast majority of human actions in a purely mechanical way, i.e., by supposing humans are machines. We need not assume that there is some life-force in is that is responsible for breathing, digesting, and other bodily functions. (Descartes thinks lower animals can be fully understood as machines; humans, however, have a rational, thinking part, which is not reducible to the operation of a machine.)

The human body. Descartes continues describing the fable of his imagined world, to include living things. Descartes says that the humans in this imagined world have two parts: a body and a soul; the soul contains our minds, our 'thinking substance.' The body, however, is "nothing but a statue or machine made of earth, which God forms with the explicit intention of making it as much as possible like us." Clocks and other machines "have the power to move of their own accord" -- and Descartes thinks animals' power to move can be explained mechanically as well.

"Animal Spirits." Descartes believes that, within our blood, there is a certain kind of body he calls 'animal spirits.' This material is very small and fast moving -- and thus you should not be surprised that Descartes calls it a kind of flame. This stuff runs through our nerves into our brains, and as it flows into a certain body part, the muscles in that body part are activated. For example, Descartes says "breathing and other such activities which are normal and natural to this machine, and which depend on the flow of the spirits, are like the movements of a clock or mill, which the normal flow of water can render continuous" (100-101).

How bodies react to external objects. When an external object affects a certain part of the body, the nerves in that part of the body are moved. Descartes says that "when they are moved, ... they simultaneously pull the parts of the brain from which they come." Then the animal spirits descend from 'storage tanks' in that part of the brain to the appropriate body part to cause the body to move. When the nerve fibers are pulled so violently that they are damaged, pain results. If a series of fibers next to each other are all pulled equally, then we sense smoothness; if this same series all register different degrees of pull, then we perceive the body as rough.