



The Scientific Revolution with Dr. Ted Davis

Lesson 6.1: The New World View: Of Animals and Machines

Outline:

The New World View: Of Animals and Machines (The Mechanical Philosophy)

- How do we conceive of nature?
- The old world view involved personifying nature, in whole or in part. Plato held the view that the world has a soul as in *Timaeus*.
 - Personifying nature as a woman, as in the image from German alchemist Michael Maier, *Atalanta fugiens* (1617).
 - Natura, the noun for nature, is feminine.
 - Nature as the link between God and humans, *Utriusque* (1617-21) in the image from English physician Robert Fludd. Nature is depicted as a woman.
 - For example, William Gilbert's view that the two poles of a magnet are like the two sexes. As he says it, a lodestone embraces iron and conceives magnetism in it. This treats lodestone as if it were alive. The old world view involved "a projection of the human psyche onto nature" (Richard S. Westfall).
 - This was a way of describing induced magnetism.
- Compare this with René Descartes' theory that magnetism was caused by invisibly small, corkscrew shaped particles of matter, moving in great closed loops through the earth & around it. He explains this phenomenon with brute [animal-like] matter & motion, not by innate minds of souls. (*Principles of Philosophy*, René Descartes, 1644)
 - "This approach – explaining natural phenomena in terms of matter and motion – became known as **"the mechanical philosophy."** It became the dominant view of nature during the Scientific Revolution.
 - Instead of seeing nature as alive, Descartes saw all of nature – even living things – as complex machines. "I suppose the body to be nothing but a statue or machine made of earth." – *Treatise on Man* (1633). He also spoke of "clocks, artificial fountains, mills, and other such machines which, although only man-made, have the power to move of their own accord."
 - Descartes believed that creatures other than humans entirely lacked intelligence. Aristotle thought so too.
 - The "soul of a brute [an animal]" is like a "water organ" that can "institute, for ends necessary for itself, many series of actions."
 - **On this view, minds, souls, and God were not mechanical – they transcended matter. God was pure mind, and most**



created things were pure body. Humans, however, were both mind and body – an interactive unity of the two basic substances.

- Descartes: “All human beings no matter how dull or stupid, even madmen, can arrange various words together and fashion them into a discourse through which they make their thoughts understood. Contrariwise, no animal however perfect or well-bred can do anything of the sort. This is not simply because they lack the right organs, because...parrots can learn to utter words as well as we can...” – “...and people born deaf and mute – who are at least as handicapped as the beasts are – have the custom of inventing their own signs, with which they communicate...”, “[All of which] proves that the beasts have less reason than people, but that they have none at all.” *Discourse on Method*
- The mechanical philosophy was a highly successful approach to many aspects of nature. For example, English physician William Harvey (1578-1657), who discovered the full circulation of the blood (1628).
 - Harvey drew a strong mechanical analogy between the heart & a water pump: the doors in the heart are like “clacks [valves] in a water bellows [pump]”.
 - “The motion of the heart, then, is of this general type. The chief function of the heart is the transmission and pumping of the blood through the arteries to the extremities of the body. Thus the pulse which we feel in the arteries is nothing else than the impact of blood from the heart.”
 - Harvey based his conclusion upon observations, experiments upon humans and live animals – especially dogs – and upon a mathematical argument about the quantity of blood pumped by the heart in a period of time.
- The mechanical philosophy encouraged animal experimentation. Descartes and some others believed that animals, as brute machines, do not suffer pain. Why experiment with animals? To advance human knowledge. It was the only way to learn certain things especially in physiology.
 - Joseph Wrote of Derby, “Experiment with an Air Pump” (1768)
 - Animal experimentation wasn’t something that just began in The Scientific Revolution.
 - Background: The experiments of the Greco-Roman physician and anatomist Galen (2nd century AD). There are even chilling reports of human vivisection in ancient Alexandria, reported centuries later by Celsus – it is unclear what to make of these (Galen, *Opera omnia*, 1565).