Week 2. Wizening up. Living Matters.

CARTESIAN THINKING AND THE MECHANIZATION OF THE WORLD





HOW MATTER MATERIALIZES. MATTER IS AN ACTIVITY.











The 17thC Scientific Revolution

THE ENDARKENMENT

Where Did Western 'Scientific' Thinking Come From? Why Was It "New"?

12th - 15th C European viewpoint: Angels, Humans, and Anima (anima<u>ls</u>). Everything is ensouled (full of anima) and relating. All are subjects.



Anima Mundi, National Library of the Netherlands

The world is alive and the Sacred is immanent in Nature.



Buddhism's Twelve Links of Dependent Co-Arising

71

Setting the Scene: the Arising of 'Science' as a European Worldview in 17thC

The word "science" (scientia) meant knowledge until the 18th century. It included theology ("mother of all sciences") and Natural Philosophy (Philosophia Naturalis), which was also called physica or physiologia; it covered the entire domain of the created world, including everything from inanimate stones to human mental faculties and the winds and stars.

72

Historical influences contributing to the rise of Science as a worldview.

- Plague had decimated Europe (came from Asia); the first signs of the Black Plague in Europe were present around the fall of 1347.
- In the span of three years, the Black Death killed one third of all the people in Europe. (The last recorded case was in 1750.)
- Catholic Church explanations were failing to reduce the prevalence of plague and were unsatisfactory for explaining how and why disease was present or not, and how to be well.





Historical influences contributing to the rise of Science as a worldview.

There was a generalized atmosphere of difference and separation in Europe.

- The Eighty Years' War or Dutch War of Independence (1568–1648) ended.
- The Thirty Years' War, fought primarily in central Europe (1618-1648), ended. (One of the longest and most destructive conflicts in human history, as well as the deadliest European religious war in history, the war resulted in eight million fatalities.)
- In England: the Hundred Year War 1337-1453 and the War of the Roses 1455-1485.





Historical influences contributing to the rise of Science as a worldview.

Constantinople collapsed in 1450:

Judaic and Islamic thinkers migrated en masse to the west bringing with them other ways of understanding the world:

- The idea of the body as belonging to God begins to be challenged; previously outlawed, the practices of anatomy and dissection arise.
- The idea of recording ideas as essential and respected rises: the scribe replaces the traveling story teller, the printing press is developed in 1440 allowing ideas to coalesce more quickly, the pencil is developed in early 1500's.

The Siege of Constantinople (1453) Jean Le Tavernier 1455.



Historical Influences Contributing to the Rise of Science as a Worldview.



the Flammarion wood engraving (1888)

- The Catholic Church was increasingly considered to be corrupt and amoral in the 16th C.
- One of the predominant questions being asked outside the Church in these intellectual centers was: Are humans part of anima mundi, and if so, what part do they play and how do they play it?

Historical Influences Contributing to the Rise of Science as a Worldview.

- **Rise of mathematics.** Belief in math, as thought by men, is a reflection of God's thinking. **The world can be understood mathematically.**
- Rosacrucian movement. Early 17th C mix of Kabbalah, Hermeticism, alchemy, and Christian mysticism. Michael Maier (1568– 1622), an early Rosacrucian, held that "esoteric" rosicrucianism's "origins are Egyptian, Brahmanic, derived from the mysteries of Eleusis and Samothrace, the Magi of Persia, the Pythagoreans, and the Arabs." In other words, the world in its wholeness has been and is mysterious to the human mind. Survival depends on reinvoking the esoteric wisdom of the past.
- In England, the monarchy needed new sources of revenue, Francis Bacon (1561-1626) proposed that natural philosophy and the new "scientia" could be a new source of employment for men and revenue for the monarchy.





The Temple of the Rose Cross, Teophilus Schweighardt Constantiens, 1618

17thC. Thinking: Descartes' Nightmare Revelation on 10 Nov 1619



ORGANISMS ARE MACHINES ORGANISMS OUR AUTOMATA ORGANISMS DO NOT THINK ORGANISMS HAVE NO LANGUAGE ORGANISMS HAVE NO CONSCIENCE ORGANISMS ARE WITHOUT FEELING

"I have described the earth and the whole visible universe in the manner of a machine." -René Descartes. 1596 - 1650. "ONLY WHAT WE ARE ABLE TO SEE IS REAL.

NO IMMANENCE OR MYSTERY EXISTS; IT IS JUST NOT YET KNOWN BY THE HUMAN WHO IS DIFFERENTIATED BY <u>HIS</u> ABILITY TO THINK."

(THE FEMALE IS AN EMOTIONAL AND BODILY BEING — THE FEMALE IS NON REASONING— LESS THAN THE MALE.)



"THE "WHOLE" IS ONLY ITS PARTS PUT TOGETHER AND IS REDUCIBLE TO THESE PARTS."

"ALL IS CLOCKWORK, MECHANISM, AND LINEAR."

"EXPERIMENT, AND IF OTHERS CAN REPRODUCE WHAT YOU HAVE SEEN, THEN IT IS TRUE AND "REAL"."



Descartes' Scientific Method: the 4 Precepts

1. Doubt everything that cannot be directly observed. Direct observation only is scientifically valid.

2. Break every problem into smaller parts. Reduce everything observed to its parts. The whole can be derived from the parts.

3. Solve the simplest problems first. There is an order. It is linear: cause and effect.



4. Be thorough. Experiment and repeat. If what you see is True, others will be able to arrive at the same conclusion.



Further research: T.K. Rehfeldt. Descartes and scientific method. Rasch Measurement Transactions, (1) 993, 7:2 p.291.

Descartes Theorized a Split of Mind From Body.

Body Becomes Mind-Less. Mind Becomes Body-Less. Dualism Arises. Reason Eclipses Sensing As "the Way of Knowing'.



• res extensa (extended thing) or "corporeal substance", feelings, and sensing.

• res cogitans (the thing that has the power to think) or human mind. Reason is the only 'legitimate way of knowing." Humans are the only beings able to reason. Mathematics is the highest form of reasoning available to *man*.

81

Artwork: Marc Quinn. Emotional Detox: The Seven Deadly Sins IV, 1995

Learning To See in "Cartesian": Making Things Into Objects and Subjects

"I, as human mind, am subject; all else is object, including my physical body. 'I' am a ghost in the machine. No other being has subjectivity or agency. Mathematics as a pure creation of mind, untainted by the physical, is the only trustable way for a human to know anything." -Descartes

Descartes' Worldview

The world is a machine with no feeling, no living intentional beings, a dead "clockwork" universe. No longer is Nature full of subjects animate, sentient, living beings. All bodies are machines. As machines, they can and will break and lose their usefulness.

Nature and everything outside the head of the human is an object...and is now available for having things done to it/them.

"Experimentation" rises as the means for "knowing" the world.



Descartes' Worldview

In this "clockwork" universe, even God has retired to some far off edge of the universe, having set the great clock into motion and humans are reasoning and rational spectators of the great machine — their bodies mere mechanical automata for ferrying their minds about.



Celestial globe with clockwork. Gerhard Emmonser. 1579. the Metropolitan Museum

Descartes' Worldview

- LINEARTY and LAWS undergird everything.
- Reality is out there and is <u>observable</u>. The only reality that counts is what can be seen. Meditative or feeling based observations are disallowed.
- Like a jumbo jet or a building, every thing is a complicated collection of parts organized in a particular way. Every 'thing' can be ultimately understood by the human who is above and separate from all others.
- "Reductionist ontology:" Take things away from each other in order to understand how they add up.



Isaac Newton: The Mechanistic Worldview substantiated

Isaac Newton (1643-1727) completed the separation of humans from nature by picturing Nature as something "out there" composed of mechanical building blocks in interaction that humans could observe.

The idea of Nature as full of subjects gave way to Nature as objects.

Newton generalized the observations made by Galileo and others of the motions of falling bodies, swinging pendulum's, and planetary orbits into three laws that would describe the working of the entire cosmos: the Law of Inertia, the Law of Mass and Acceleration, and the Third Law of Motion.

To understand meant to break it down into the components and explaining the causal links between them.

Nature became a clock that science could take apart and reassemble.

The clock metaphor became the overriding metaphor of the scientific enterprise.

Prediction and control became the driving forces of a new scientific way of seeing the world.



The Mechanistic Worldview From Descartes to Now: The Decline of Community and The Rise of Individualism

This mechanistic worldview continued to proliferate over the following centuries. The emphasis on the **separateness of individual human consciousness** lead to a worldview of nature as a vast collection of objects that could be subject to scientific investigation and experiment. This included the human body. To be human meant being separate from the world, disembodied, a free floating untethered collection of thinkings. Bodies did not belong to their human consciousnesses.

In the world of music, in the 16th C, a concerto was a vocal composition in which vocal music was accompanied by an orchestra. Post Descartes, by the middle of the 18th century, it was viewed as a musical form in which a single instrument, piano or violin, was "set against" the orchestra to assert its individual vision "against" the whole of an orchestra.

Literature saw the decline of verse epics and the development of the human-centric novel and the biography.

In the scientific world, Cartesian efforts unmasked their own limitations.

Contemporary Western Science Still Asks Three Basic Questions

- 1. What's there? ... (objects/subjects)
- 2. How does it work? ... (separate into parts)
- 3. What can I <u>see</u> about how it came to be this way?...Invisible items, influences, or things derived from my senses do not count.



BUT what happened in science is that as scientists broke things down, things expanded, e.g. in genomics, genetic inheritance turned out not just to be vertical but also horizontal and sometimes willy nilly.

We have all had this experience: tackling a seemingly simple thing only to find it is complicated beyond anything we knew. And this is what happened to classical science; thus quantum and complexity sciences emerged.

Counting constituents wasn't enough to explain everything. Cartesian ways could count parts but they couldn't account for communities (wholes).



Wikimedia commons File: Goe Platz der Synagoge Detail 2 noCA.jpg commons

When biologists asked what's there? They saw a multiplicity of organisms braided together into holobiomes.

When microbiologists asked what do they see? They saw communities of bacteria, fungi, and viruses.

When physicists tested electrons, they discovered that electrons could be waves and/or particles or neither or both.







Something was going on between and among the parts which was itself some "thing."

The verb(s) were missing. The ing-ings were missing.

Thus, "how does it work?" expanded to include "how is it working?"

