The Liberal Arts Tradition
with Dr. Kevin Clark and Ravi Jain

Lesson 13: Philosophy and Natural Philosophy

Outline:

Philosophy

- Philo- : Love
- -sophos : Wisdom
- The pre-critical stages of piety, gymnastic, and music are the cultivation of loves and the liberal arts are the tutoring of the reason to lead unto wisdom. **Philosophy is an encapsulation of wisdom that must be joined to love.**
- The Sophists used rhetoric just for power, but in philosophy there is a sense that if you love wisdom you will submit to the truth you find. If you reject the truth you know, you will be shut off from further insight.
- Wisdom is a person who is calling. The beautiful evokes the love of wisdom.
- The Medievals organized bodies of knowledge into natural philosophy, moral philosophy, and divine philosophy (metaphysics).
    - **Natural Philosophy:** What kind of truths can be known about creation? Newton understood himself as a natural philosopher. Natural science was understood as part of natural philosophy.
    - **Moral Philosophy:** Man and his relationships and the society which he inhabits.
    - **Divine Philosophy:** What is reality? What is language? What is eternal? Is there an underlying reality? Does the world of nature and the world of human history come together?
- Philosophy is kind of in a body, up head down dimension.
    - Philosophy is guiding thought and practice. Philosophy helps us understand the classes, subjects, and disciplines in the school. Later on, philosophy is studied as wisdom.
    - The tradition privileges the body up side of philosophy, it serves to direct our earliest education.
    - Things are present as guiding principles before their known fully as rational principles, as seeds that grow into trees that come from the trees that have proceeded them.

Natural Philosophy & Natural Science

- Natural science is a very contended discipline. What is the proper domain of science?

- The demarcation problem: What distinguishes science from other forms of human knowing? Was there a time when people referred to this kind of knowledge as a unified thing?
    - 1830s: Many Romantics were calling themselves artists, which was someone who is only engaged in the fine arts or the performing arts. This was in contrast to an artist as one who joins imitation with reason. Those who were doing natural philosophy were called scientists at this point.
        - Christianity was influential in the rise of science. Natural science is an outgrowth of medieval theology. Science is born in the cradle of Christianity.
        - There were times when natural science was not so contended. When you get to this place, you see natural science being used less and natural philosophy being used more.
- Natural philosophy is a discourse that incorporates natural science and all the particular natural sciences (biology, physics, and chemistry). It does so in the context of meaning and purpose. Qualitative and mathematical descriptions of reality were both recognized as important.
    - **Natural history** had vast compendiums of observations of different plants and animals. These were influential through the Middle Ages.
    - Natural history was not the same thing as natural science. **Natural science** has more in common with the idea of logical ordering and syllogism as it comes to us from Aristotle.
    - The conversation between natural historical and natural scientific brings great insight.

Piety

- **We could gain more insight from looking backward into the history of science rather than looking forward.**
    - Natural scientists used whatever means they had to discover truth.
    - They made robust observations of the natural world.
    - How do you make sense of this empirical knowledge? There is the process of looking for the cause of the phenomena. This is the pursuit of science (rather than natural history).
        - Working in the theoretical mode (hypotheses), this is used to predict more phenomena.
        - Piety, gymnastic, and music prepare students to think creatively.
- Science does not proceed only from observation and rational explanations of those observations. There are other influences like imagination, God and how he interacts with Creation, and flashes of insight.

How might we do natural philosophy in our classrooms?

- Look alongside of those who have gone before.

- Recapitulate experiments that led to insight. This allows the students to follow the narrative of study.
- Remind the students that there is process of observations, interpretations, and assumptions (with social implications).
- Natural philosophy is a bigger endeavor to what is now contended to be natural science.

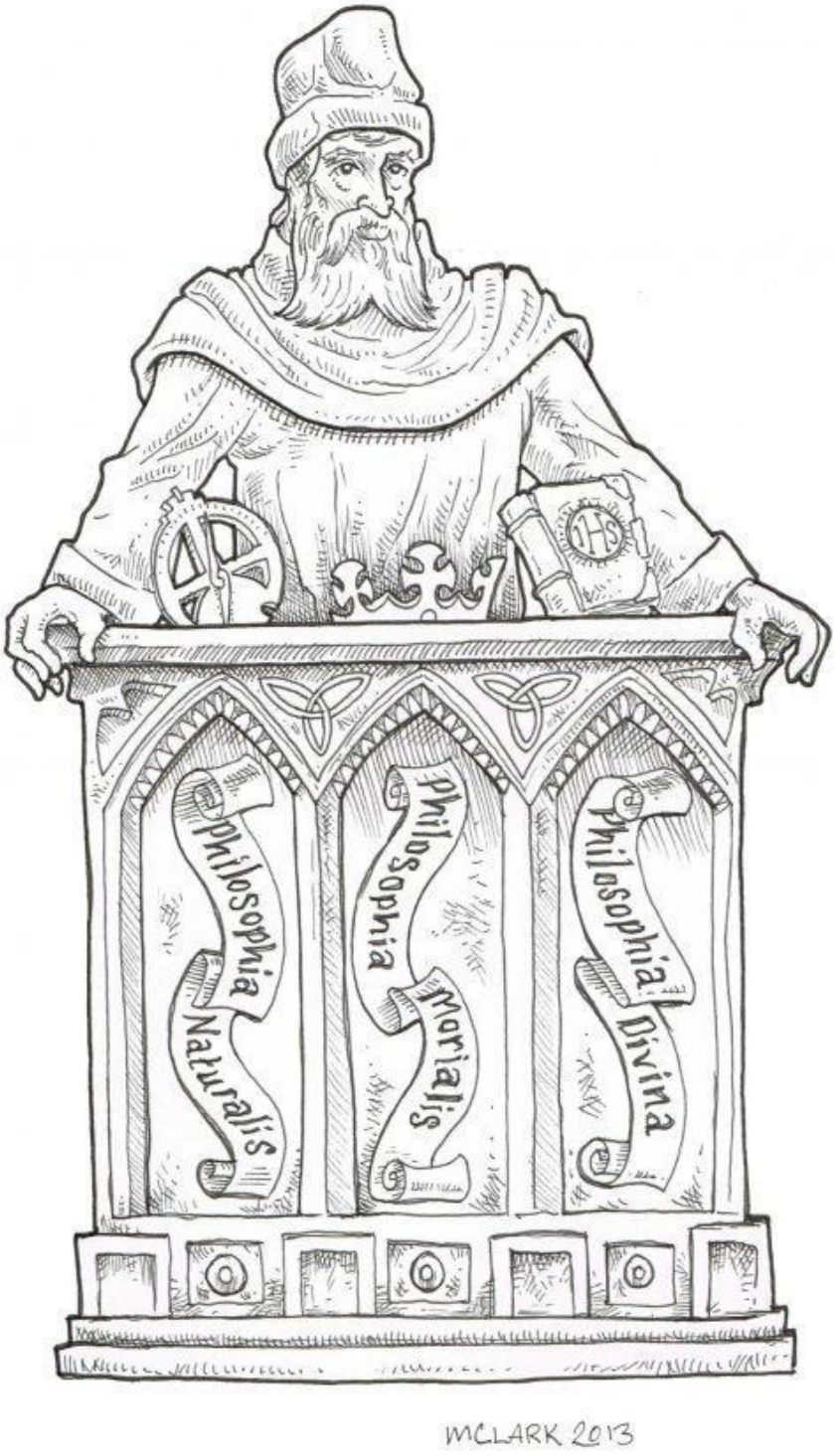
Is there a wisdom that has gone before us? There seem to be conversations that have gone underground today.

- Aristotle's Four Causes
  - **Material and Efficient Cause**
    - Material Cause: The bronze of the bronze statue
    - Efficient Cause: The tool or artisan who made the bronze the statue
  - **Formal and Final Cause**
    - Formal Cause: The actual or figure or shape that the statue has
    - Final Cause: The purpose, why is that statue made
- For thousands of years these Four Causes were understood as all playing a role in understanding the natural world. In the Scientific Revolution, Galileo and Descartes said that the only things that really matter are the motion (Material and Efficient Causes).
  - Galileo and Descartes may have allowed the Formal and Final Cause for defining a statue, but not for natural things.
  - Descartes said that animals are just matter in motion. They don't have essence of themselves, they are a haphazard arrangement of atoms. They were deterministic.
    - We have to recognize an organization that there is something animating the animals.
    - Is there a reflected purpose in animals?
- "Is there such a thing as Formal Cause?" has come back a question.
  - Is there is distinction between cells and tissues?
    - It seems like there are different levels of reality (emergence).
    - How did one level get to another level?
  - Formal and Final Cause seem to have underground. For Aristotle the big distinction was between act and potency.
    - Energy has two ways of expressing itself (brought back in the 1800s):
      - Kinetic: Act
      - Potential: Potency

Distinguish between demonstration and following the question:

- By recapitulating the canonical experiments you are giving students some of the best puzzles, questions in history (Pascal, tube filled with wine).
- These puzzling questions arouse wonder in students.

- If you give students a trajectory to follow, it is clear that Natural Philosophy is actually developing over time and the great scientists and philosophers are talking with each other (Maxwell and Einstein).
- The textbook is ordered from first principles to phenomena. The textbook is not ordered for students to discover anything. Help the students to discover it in the same order that it was discovered.
- The steps along the way are micronarratives (pedagogy of inquiry, discovery, puzzle, proof, and play):
    - How do I motivate this one thing through discovery as opposed to demonstration?
    - How do I give the students space and time to make the discovery? This makes experiments are rite of passage and provides great insight for students. They may see how math is woven throughout all of reality.



Philosophy
by Matthew Clark