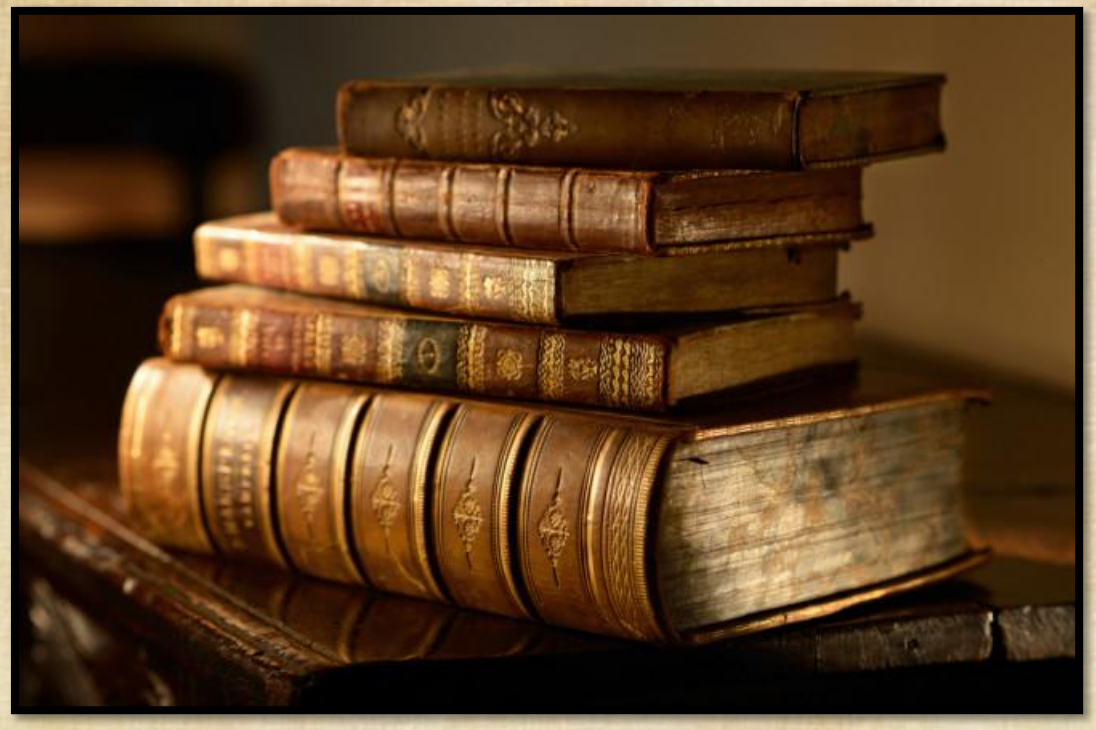
How Does Science Fit into a Classical Education?



Why study science in a classical education?

- Science is arguably the most distinctive feature of modern Western culture
- What should science's role be in culture?

What is the problem with science in a classical education?

Science

- Science is viewed as a method
- Scientific knowledge is seen as more objective and certain than other forms of knowledge

Classical Education

- Classical education is focused on the arts, which are grounded in skills
- Arts depend on the skill of the practitioner

My journey

- Trip west to start Ph.D.
- End of Ph.D. in Science
- Ph.D. in Philosophy of Science

What is the solution to the problem of science in a classical education?

- There is no dichotomy
- Science is high art

What is science and how do you do it?

- Start with the Copernicans; they founded modern science.

Ptolemy got it right

- Sunrise: Earth stationary; the sun moves
- Celestial navigation

Copernicus

- **Question:** Why did Copernicus even look for a new theory?
- **Answer:** Ptolemy's theory is a monstrosity

- **Question:** Why does Copernicus think his theory is true and that he is justified in claiming his theory is true?
- **Answer:** It is more rationally compelling

- **Observation:** It does not have greater predictability

Galileo

- **The myth:**

  Copernicus found astronomy on the brink of collapse, burdened by Ptolemy's epicycle after epicycle. He replaced Ptolemy's theory with a simpler theory, which was more accurate. When Galileo took up the Copernican cause, he ran into the obscurantist Catholic Church, which used Aristotle and Scriptures to defend Ptolemy against the new scientific method, based on observation and experience.

Galileo quotes:

- “Nor can I ever admire the outstanding acumen of those who have taken told of this [Pythagorean- Copernican] opinion and accepted it as true; they have through sheer force of intellect done such violence to their own senses as to prefer what reason told them over that which sensible experience plainly showed to the contrary…”

- “...there is no limit to my astonishment when I reflect that Aristarchus and Copernicus were able to make reason so conquer sense that, in defiance of the latter, the former became the mistress of their belief.” (p. 328)

Implications of the Copernican view

- Science is not hypothesis testing
- Science is not fundamentally grounded in observation and experience
- The Copernicans were writing and critiquing theories

Implications of the Copernican view (continued)

- Modern scientists agree with the Catholic Church against the Copernicans
- How did this happen?
- Conclusion: Science is high art. It is about assessing theories. No empirical method can mechanically do this.

Science as high art

- All arts are based on skills
- The nature of skills
- Observation as an art

Observation as an art

The method of science

1. Start with everything that we believe is true (pre-understanding)
2. A new observation that initially does not fit our understanding
3. Ask what are possible explanations of the new observation
4. Possible solutions begin with minimal changes to our pre-understanding

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The method of science (continued)

5. Come up with a possible explanation

6. Test it. If true, what else should be the case?

7. Accept

8. Modify pre-understanding

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Implications

- Science method is not different from how we know in other fields
- Science cannot be reduced to a mechanical method; it is high art

Conclusion: How science fits in a classical education

- The dichotomy between science and arts is false
- Science is no different than other fields
- Classical texts form the foundation of the investigation
- There is no direct appeal to objective facts, because there are none

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