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PHI 516/HOS 593
RATIONALIST PHYSICS: DESCARTES, HOBBS AND LEIBNIZ
Monday, 10AM-12:50PM
Marx 201
Autumn 2021

In this seminar we will examine a certain style of natural philosophy in the 17thC which emphasizes metaphysics and rational principles, as practiced by Descartes, Hobbes, and Leibniz. Topics covered include speculations on the nature of body, the laws of nature, the notion of force, and large-scale principles that were taken to govern the material world. We will focus on the mechanist thought in Descartes and Hobbes, and how it evolves into Leibniz's dynamics, as well as the relations between these figures and other important natural philosophers, including Galileo and Newton. In addition, we will relate this strand of thought with more experimental strands in natural philosophy, and with non-mechanist and animist matter theories of the period. The focus will be on reading primary source materials, though secondary source materials will be referenced.

While this seminar is directed at students in the history of philosophy and the history of science, it is designed as a kind of survey of an important strand in seventeenth-century philosophical and scientific thought, suitable for students whose main work is outside of the area but who would like an introduction to the figures and issues treated.

Below are the tentative readings for the term. I realize that they are somewhat ambitious; the syllabus may be altered as we go. Before each session of the seminar, I will send out a long note, with some thoughts about how to approach the readings and what the emphasis in class will be.

SCHEDULE

W1 (SEPT. 13): INTRODUCTION: SETTING THE STAGE

Scholastic natural philosophy: what everyone learned at school in 1620.

Novatores: Alternatives to scholastic natural philosophy before Descartes.

Descartes: the ambition to reinvent the world

Required Reading:

Sennert, excerpts from *Thirteen Books of Natural Philosophy* [On Canvas under "Modules"]

Tables of contents of some scholastic texts in natural philosophy and mathematics from the early 17thC [On Canvas under "Modules"]

Garber, "Novatores" [On Canvas under "Modules"]

Descartes, *Discourse on the Method*, parts 1 and 2 [CSM I, pp. 109-22]

W2 (SEPT. 20) DESCARTES I

What a science looks like for Descartes

The foundations of Cartesian physics: space, motion, and the laws of nature

Required Reading:

Descartes, *Rules for the Direction of the Mind*, rules 1-3 [CSM I, pp. 9-15]

Descartes, Preface to the French edition of the *Principles* [CSM I, pp. 179-92]

Descartes, *Treatise on Light*, chaps. 1-7 [Gaukroger, *The World...*, pp. 3-32]

Descartes, *Principles of Philosophy*, part 2 [Excerpts are found in CSM I, pp. 223-47. I will post the complete text in translation on Canvas under “Modules”]

Optional Reading:

Garber, *Descartes' Metaphysical Physics*, chaps. 1 and 2 [On Canvas under “Modules”]

W3 (Sept. 27) DESCARTES II

The foundations of Cartesian physics, continued

Creation and Cosmology

The human body

Required Reading:

Descartes, *Treatise on Light*, chaps. 8-11 [Gaukroger, pp. 32-51]

Descartes, *Principles of Philosophy*, part 3, §§1-47 [Excerpts in CSM I, pp. 248-58]

Descartes, *Treatise on Man*, (excerpts) [Gaukroger, pp. 109-19]

Descartes, *Description of the Human Body* [Gaukroger, pp. 170-86]

Optional Reading:

Descartes, *Discourse on the Method*, part V [CSM I, pp. 131-41]

W4 (Oct. 4) DESCARTES III

Method and optics: combining reason, mathematics and experiment (law of refraction and the explanation of the rainbow)

Required Reading:

Descartes, *Rules for the Mind*, rules 4-8 [CSM I, pp. 15-33]

Descartes, *Dioptrics*, Discourse 2: Of refraction [Gaukroger, pp. 76-84]

Descartes, *Meteorology*, Discourse 8: On the Rainbow [Gaukroger, pp. 85-96]

Optional Reading:

Garber, “Descartes and Experiment in the *Discourse* and *Essays*” [On Canvas under “Modules”]

Sennert, *Thirteen Books of Natural Philosophy*, excerpts from bk II ch. 2 (on light) and bk. IV, ch. 9 (on the rainbow) [On Canvas under “Modules”]

W5 (Oct. 11) DESCARTES IV

Descartes vs. Galileo on Free Fall: Two Competing Programs for Mathematical Natural Philosophy

Required reading:

Descartes, *Treatise on Light*, chapt. 11 [Gaukroger, pp. 47-51]

A collection of texts from Galileo and Descartes on the debate over free fall will be posted on Canvas under “Modules”.

(Oct. 18: Fall Break)

W6 (Oct. 25) HOBBS I

The program for philosophy: the *Elementa philosophiae* project

The program for natural philosophy

Required reading:

Hobbes, *De corpore*, selections to be determined [On Canvas under “Modules”]

W7 (Nov. 1) HOBBS II

The program for natural philosophy, continued

Hobbes vs. Descartes on optics

Required reading:

Correspondence between Hobbes and Descartes on optics in 1641 [On Canvas under “Modules”]

Selections from Hobbes’s and Descartes’s optical writings [On Canvas under “Modules”]

W8 (Nov. 8) ANIMISM CONTRA MECHANISM

The Third Way: Animistic matter theory as an alternative to both Aristotelian matter theory and mechanism

Required reading:

A selection of readings from Bacon, Margaret Cavendish, Henry More, and Ralph Cudworth will be posted on Canvas under “Modules”.

W9 (Nov. 15) LEIBNIZ I

The young Leibniz: Hobbes and Leibniz’s first physics

The crisis and the origin of Leibniz’s dynamical program in the late 1670s.

Required Reading:

A selection of Leibniz’s early texts will be posted on Canvas under “Modules”.

Optional reading:

Garber, *Leibniz: Body, Substance, Monad*, chaps. 1 and 3. [Available online]

W10 (Nov. 22) LEIBNIZ II

The critique of Descartes’ physics

The metaphysics of the *Specimen dynamicum*: animism and mechanism combined

Required reading:

Leibniz, “A brief demonstration of a notable error of Descartes” [On Canvas under “Modules”]

Leibniz, “Critical Thoughts on the General Part of the Principles of Descartes (part 2)” [On Canvas under “Modules”]

Leibniz, *Specimen Dynamicum* [Ariew and Garber, pp. 117-38]

Leibniz, “On Nature Itself” [Ariew and Garber, pp. 155-67]

Optional reading:

Garber, *Leibniz: Body, Substance, Monad*, chapt. 4 [Available online]

W11 (Nov. 29) LEIBNIZ III

Leibniz's dynamical program: the *Dynamica*

Required reading:

A selection of materials will be available on Canvas under "Modules".

W12 (Dec. 6) LEIBNIZ IV

Leibniz and Newton: Space and time, gravitation and cosmology

Required reading:

Letter to Huygens on planetary theory [Ariew and Garber, pp. 309-12]

Leibniz, "Against Barbaric Physics" [Ariew and Garber, pp. 312-20]

The Leibniz-Clarke Correspondence

Optional reading:

Leibniz, *Tentamen de motuum coelestium causis* [On Canvas under "Modules"]

Bertoloni-Meli, *Equivalence and Priority: Newton vs. Leibniz* [Excerpts will be posted on Canvas under "Modules"]

The following books have been ordered at *Labyrinth Books*:

Descartes, *The World and Other Writings*, Stephen Gaukroger, ed. (Cambridge University Press) [Available online through the Library catalogue] [Abbreviated "Gaukroger" above]

Descartes, *The Philosophical Writings of Descartes*, John Cottingham et al., eds. vol. I (Cambridge University Press) [Available online through "Past Masters: Continental Rationalists" on the Library website (under "databases").] [Abbreviated "CSM I" above]

Leibniz, *Philosophical Essays*, Roger Ariew and Daniel Garber, eds. (Hackett Press) [Available online through "Past Masters: Continental Rationalists" on the Library website (under "databases").] [Abbreviated "Ariew and Garber" above]

Leibniz and Clarke, *Correspondence*, Roger Ariew, ed. (Hackett Press)

Students typically earn credit by attending class sessions and writing a term paper, completing a take-home final exam, with or without an oral exam, or by some other project, with the approval of the instructor. For those who would like to take this course for credit, or, if you are a graduate student in Philosophy and want to get a unit for your work in the course, please see the me, and we will arrange an appropriate final exercise, based on your interests and your level of preparation. All students participating in the course are encouraged to do at least one short in-class presentation of roughly ten to fifteen minutes. For graduate students in Philosophy this can count toward the "in seminar presentation" requirement.