

SCIENCE AND RELIGION

HPS 0620 / PHIL 0840

SPRING TERM 2010

Instructor: Benny Goldberg
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Class Time: Tuesday/Thursday 1-2:15
Location: 208A Cathedral of Learning

Office Hours: Wednesday 12-2:30
or by appointment

In the inbox for this account you will be able to find the syllabus and any readings not in the texts or online.

REQUIRED TEXTS

1. Ferngren, Gary B. (2002). Science & Religion: A Historical Introduction. Johns Hopkins University Press: Baltimore.
2. Ruse, Michael (2006). The Evolution-Creation Struggle. Harvard University Press: Boston.

COURSE DESCRIPTION

The interaction between religion and science (or, in the ancient world, natural philosophy) in the Western world is a long and complicated one. And it has by no means been merely one of hindrance and mutual antagonism, though there certainly has been plenty of that! The purpose of this course is to explore and attempt to understand some of this history in order to gain a better understanding of both of these very human activities, past and present.

The course will start with an overview of philosophy and history of science, and then move on to ancient Greece, charting the process by which philosophy and science came to be a separate discipline from theology. From Greece we will then move forward many centuries to Medieval Europe and to the great Islamic civilization, where we will see two very different sorts of approaches to science and religion. We will then make our way to the early modern and Enlightenment periods, the 'Scientific Revolution,' where we shall see that religion was, far from being kicked aside by science, an integral part of scientific thought. Yet it is also at this time that we do begin to see each discipline start to take on those modern forms by which we understand them today. Finally, we will end the class with a discussion of Darwin and the theory of evolution, both as it was originally presented in the late 19th century as well as through the lens of court cases in the United States.

Class Structure

Most classes will be structured as follows:

- Hand in reading responses
- Introductory Lecture – (10 minutes): I will use the first part of the class to introduce the topic, and to set up some of historical background to the issues.
- Break – (5 minutes)
- Discussion – (60 minutes): These discussions will be based around your reading responses for each week, and will be student led.

Learning Objectives

Students who successfully complete this class will have developed skills that will enable them to:

- Describe the complexity and variety of historical approaches to the study of nature and its relation to religious thought.
- Analyze (read, understand, contextualize) difficult, unfamiliar primary sources.
- Form arguments based on historical, philosophical, and scientific evidence to support your positions.
- Discuss the complicated issues surround science and religion in a thoughtful and respectful manner.
- Write in a logical, well-structured, clear, concise and thoughtful manner.

On Reading Assignments

This class requires a lot of reading, most of which is very difficult. I expect you understand the basic arguments and points being made by the authors, and to be able to discuss the readings.

For each reading assignment, I suggest you try to do the following three things:

1. Write down the overall structure and conclusion of the reading. This shouldn't be full of details, but should be a mere sketch or outline of what you read. This will help you remember what the reading was about!
2. Locate one or two main arguments and briefly write down their premises and conclusions. Then think about the following questions: Is the argument convincing? Why or why not? How would you evaluate the argument? Is it rational? Does it involve magical/mystical thinking? How does this argument relate to other arguments and readings we have covered so far?
3. Write down all the terms you don't understand and look up their definitions. Write down any confusions and questions you have about the reading, and bring them to class so that we might discuss them and dispel any confusion.

Grading

Grading Scale

100-98% A+	97-92% A	91-90% A-
89-88% B+	87-82% B	81-80% B-
79-78% C+	77-72% C	71-70% C-
69-68% D+	67-62% D	61-60% D-

Reading Responses (20% of your grade)

Each class comes with a set of assigned readings. You are responsible for not only reading the assigned material, but for writing responses to **12 of the readings**. That is, you must turn in roughly one response per week. **LATE RESPONSES WILL NOT BE ACCEPTED!** **The response will be handed in at the beginning of class; they should be no longer than 1 page (back and front).** You do not need to discuss all of the readings, nor every part of any particular reading; focus on what is interesting to you!

Your response should contain the following elements in the following order:

1. Questions you have about the content of the reading.
 - a. E.g.: What does rational mean for Aristotle? What is Xenophanes conception of God? Why did Aquinas think natural theology was a lesser road to knowledge of God? Etc.
2. Reaction to the readings. This is where you state :
 - a. The main point or thesis or fact presented by one or more of the readings (there may sometimes be multiple theses, which may be in conflict—if this is so, your response should reflect this);
 - i. Make sure to **SUPPORT** this claim by a quote or citation from the reading.
 - b. What you think about this main point, i.e., your opinion about it.
 - i. Make sure to **SUPPORT** your opinion by providing evidence for why you think you are right.

Class Discussion (20% of your grade)

Your discussion grade will come both from your taking part in class discussions and from leading two class discussions. At the beginning of the term, I will hand out a discussion leading sign up sheet—each class will have one or two discussion leaders who will be responsible for providing an introduction to the topics being discussed, and helping lead that discussion. (I will, of course, help out!). **Every student must lead at least ONE discussion over the course of the term. If someone else is presenting on your day, you can either choose to work with him or her, or do it separately; but make sure there is no overlap between your presentations (i.e., plan ahead with your discussion mates!). Feel free to make handouts, though you need not.**

You might want to adopt the following structure for you presentation:

1. Introduce the part of the readings you are discussing
2. Discuss confusions or difficult to understand passages from the readings

3. Suggest some questions about the readings for discussion
4. Start the discussion by suggestion some answers to those questions

Midterm Essay (30% of your grade)

The history of the interaction between science and religion is certainly a complicated one, and the full story is not one of pure antagonism or pure cooperation; both tendencies are found throughout history. There are four elements you must discuss in your essay:

1. Describe the different approaches that historians have taken in understanding the history of science and religion.
2. Pick out an example of antagonism between science and religion in the readings we have studied so far. Describe in your example how the scientific and religious elements interacted, and illustrate how this interaction was negative (antagonistic).
3. Pick out an example of cooperation between science and religion in the readings we have studied so far. Describe in your example how the scientific and religious elements interacted, and illustrate how this interaction was positive (cooperative).
4. Finally, construct an argument as to which approach to the history of science and religion you think is best based on your two examples.

Your essay must meet the following criteria:

- **Typed up, with all pages stapled together**
- **NO MORE than 8 pages (it need not be this long however)**
- **Double spaced**
- **Times New Roman or Cambria fonts only**
- **Uses proper citation methods**

DUE TUESDAY, MARCH 16 IN CLASS (YOU CAN HAND IT IN ANY TIME BEFORE THIS DATE HOWEVER!)

Final Essay (30% of your grade)

Write your own decision for the Kitzmiller case. You may cite not only the court records we have read for class, but also any of the other court records we did not look at, and any of the readings we have studied. Your decision must include at least the following:

1. A summary of what the case was about.
2. A section where you set this summary in historical context—that is, you place this specific debate between science and religion within the larger history of such debates.
3. Your decision for either the defendant or the plaintiff and your argument for that position (using the court records and class readings).
 - a. This decision should be a philosophical and historical argument; it is NOT a legal argument, and you need not discuss any particular law or laws.
4. The potential impact of your decision for science education in the United States

NOTE: Even if you agree with the actual decision made by the judge, your decision must use different arguments, and must reflect what we have discussed over the course of the term.

Your essay must meet the following criteria:

- **Typed up, with all pages stapled together**
- **NO MORE than 8 pages (it need not be this long however)**
- **Double spaced**
- **Times New Roman or Cambria fonts only**
- **Uses proper citation methods**

DUE FRIDAY, APRIL 30TH BY 2PM IN THE ENVELOPE IN MY MAILBOX IN CATHEDRAL OF LEARNING 1017 (YOU CAN HAND IT IN ANY TIME BEFORE THIS DATE HOWEVER!)

Policies

Academic Integrity

You are expected to adhere to the standards of academic integrity. Cheating or plagiarism, in any form, are strictly forbidden and will be punished to the extent that University policy allows.

Information about the University policy on academic integrity can be found at the following URL: <http://www.fcas.pitt.edu/academicintegrity.html>.

Special Consideration

I recognize that some students might need special accommodations. If you have a disability that requires special testing accommodations or other classroom modifications, please notify me, as well as Disability Resources and Services, by the second week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of the accommodations. To notify Disability Resources and Services, call 412-648-7890 (Voice or TDD).

Their internet address is: <http://www.drs.pitt.edu> . The office is located in the William Pitt Union Room 216.

Useful Reference Web Sites

Stanford Encyclopedia of Philosophy:

<http://plato.stanford.edu/>

Talk Origins

<http://www.talkorigins.org/>

SCHEDULE OF CLASSES

Introduction

Thursday 1/07: Syllabus and Introduction

Syllabus and overview
How to read Philosophy
Arguments
Historiography and anachronism
What is science?
What is religion?
What issues are you interested in?

Tuesday 1/12: Understanding the History of Science and Religion

Assigned Reading:

1. Ferngren – The Conflict of Science and Religion, Chapter 1, pp.3-11
 2. Ferngren – The Historiography of Science and Religion, Chapter 2, pp.13-27
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Thursday 1/14: Philosophy of Science and Demarcation

Assigned Reading:

1. Karl Popper – The Problem of Demarcation
(<http://plato.stanford.edu/entries/popper/#ProDem>)
2. Pseudo-Science (<http://plato.stanford.edu/entries/pseudo-science/>)
3. Naturalism (<http://plato.stanford.edu/entries/naturalism/>)
4. Derksen – Seven Sins of the Pseudo-Scientist.pdf

Science and Religion in Ancient Greece

Tuesday 1/19: The Pre-Socratics and the Beginning of Philosophy

Assigned Reading:

1. Popper - Back to the Presocratics.pdf
2. Wheelwright – Presocratics – Xenophanes.pdf
3. Wheelwright – Presocratics - Chapter 2.pdf

Recommended Reading:

1. Wheelwright – Presocratics – Chapter 6.pdf
2. Pre-Socratics: <http://plato.stanford.edu/entries/presocratics/>

Thursday 1/21: Plato's Philosophy I: The Phaedo

Assigned Reading:

1. Plato – Phaedo.pdf: 95b-100e
 2. Plato's Metaphysics and Epistemology (<http://plato.stanford.edu/entries/plato-metaphysics/>)
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Tuesday 1/26: Plato's Philosophy II: The Republic

Assigned Reading:

1. Plato – Republic.pdf: Book VII, 514a-534b
2. Platonic Myths (<http://plato.stanford.edu/entries/plato-myths/>)

Recommended Reading:

1. The Timaeus (<http://plato.stanford.edu/entries/plato-timaeus/>)
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Thursday 1/28: Aristotle's Philosophy I: Physics

Assigned Reading:

1. Ferngren, Chapter 3, pp.33-44
2. Aristotle – Meteorology Book I, Part 1 (<http://classics.mit.edu/Aristotle/meteorology.1.i.html>)
3. Aristotle - Physics Book II, Parts 1-3 (<http://classics.mit.edu/Aristotle/physics.2.ii.html>)
4. Aristotle – On the Parts of Animals Book I, Parts 1 and 5 (http://classics.mit.edu/Aristotle/parts_animals.1.i.html)

Recommended Reading

1. Aristotle on Causes (<http://plato.stanford.edu/entries/aristotle-causality/>)
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Tuesday 2/02: Aristotle's Philosophy II: Metaphysics

Assigned Reading:

1. Aristotle – Metaphysics Book I, Parts 1-8 (<http://classics.mit.edu/Aristotle/metaphysics.1.i.html>)
2. Aristotle – Metaphysics Book 12, Parts 1-7 (<http://classics.mit.edu/Aristotle/metaphysics.12.xii.html>)

Recommended Reading:

1. Aristotle's Metaphysics (<http://plato.stanford.edu/entries/aristotle-metaphysics/>)

Science and Religion in Mediaeval Christendom and Islam

Thursday 2/04: Augustine

Assigned Reading:

1. Ferngren – Early Christian Attitudes Towards Nature, Chapter 4, pp.57-71
2. The Bible - Genesis.pdf: Sections: 1-2
3. Augustine – On the literal meaning.pdf:
 - a. Book I, Chapters 1, 18, 20
 - b. Book II, Chapters 1-4, 9-10
 - c. Book IV, Chapters 21, 24
 - d. Book V, Chapters 1, 3-6

Recommended Reading:

1. Saint Augustine (<http://plato.stanford.edu/entries/augustine/>)
 2. Divine Illumination (<http://plato.stanford.edu/entries/illumination/>)
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Tuesday 2/09: Aquinas

Assigned Reading:

1. Ferngren – Aristotle and Aristotelianism, Chapter 3, pp.47-55
2. Ferngren – Medieval Science and Religion, Chapter 5, pp.57-71
3. Thomas Aquinas - Summa Theologiae Part I
 - a. Question 1: <http://www.sacred-texts.com/chr/aquinas/summa/sum003.htm>
 - b. Question 2: <http://www.sacred-texts.com/chr/aquinas/summa/sum005.htm>
 - c. Question 44: <http://www.sacred-texts.com/chr/aquinas/summa/sum049.htm>

Recommended Reading:

1. Saint Thomas Aquinas (<http://plato.stanford.edu/entries/aquinas/>)
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Thursday 2/11: Islam and Medieval Science and Religion

Assigned Reading:

1. Ferngren - Islam, Chapter 5, pp.73-90
2. Averroes (Ibn Rushd) – On the Harmony of Religion and Philosophy, Chapters 1-3 (<http://www.muslimphilosophy.com/ir/fasl.htm>)
3. Avicenna – Islamic Philosophy.pdf (read the introduction and skim the two sections by Avicenna)

Recommended Reading:

1. Arabic and Islamic Natural Philosophy (<http://plato.stanford.edu/entries/arabic-islamic-natural/>)
2. Influence of Arabic and Islamic Philosophy in the West (<http://plato.stanford.edu/entries/arabic-islamic-influence/>)

Science and Religion in Early Modern Europe

Tuesday 2/16: Early Modern Philosophy and Religion

Assigned Reading:

1. Ferngren – Early Modern Protestantism, Chapter 9, pp.117-128.
2. Popkin – Religious Background to 17th C Philosophy.pdf

Recommended Reading:

1. 1. Aristotelianism in the Renaissance
(<http://plato.stanford.edu/entries/aristotelianism-renaissance/>)
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Thursday 2/18: Copernicus

Assigned Reading:

1. Copernicus – Dedication to *De revolutionibus* (<http://www.bartleby.com/39/12.html>)
2. Ferngren – The Copernican Revolution, Chapter 7, pp.95-104
3. Westman – Copernicus Preface.pdf

Recommended Reading:

1. Copernicus (<http://plato.stanford.edu/entries/copernicus/>)
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Tuesday 2/23: Galileo I: Two Chief World Systems 1

Assigned Reading

1. Galileo – Two Chief World Systems.pdf:
 - a. To the discerning reader
 - b. The First Day
 - c. The Second Day

Recommended Reading:

1. Galileo (<http://plato.stanford.edu/entries/galileo/>)
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Thursday 2/25: Galileo II: Two Chief World Systems 2

Assigned Reading

1. Galileo – Two Chief World Systems.pdf:
 - a. The Third Day
 - b. The Fourth Day

Tuesday 3/02: Galileo III: The Galileo Affair 1

Assigned Reading:

1. Fahie – Galileo’s Life and Work.pdf, pp.263-319
 - a. NOTE: This is an old account of the affair, but it is helpful for understanding the course of events, and is probably standard interpretation among lay-people. I recommend paying attention especially to the direct quotes and the facts about names, dates and places, rather than to the analysis of the events.
2. Ferngren – Galileo Galilei, Chapter 8, pp.105-115
3. Miller – 30 years war and Galileo.pdf

Recommended Reading:

1. Galileo – Letter to the Grand Duchess (<http://www.fordham.edu/halsall/mod/galileo-tuscany.html>)
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Thursday 3/04: Galileo IV: The Galileo Affair 2

Assigned Reading:

1. McMullin – Galileo on Science and Scripture.pdf (this is a tough and long article—but it is well worth the read!)
2. The Bible (<http://quod.lib.umich.edu/k/kjv/browse.html>)
 - a. Job 9:6
 - b. Job 26:7
 - c. Psalm 93:1
 - d. Joshua 10:12-13
 - e. 2 Kings 20:11

***** SPRING BREAK! *****

Tuesday 3/16: God, Mechanism and Causation

******MID TERM ESSAY DUE******

Assigned Reading:

1. Galileo – The Assayer (excerpts)
(<http://www.philosophy.leeds.ac.uk/GMR/hmp/modules/hdc/units/unit02/assayer.html>)
2. Descartes – The Principles of Philosophy, Part II, Section 1
(<http://www.classicallibrary.org/descartes/principles/02.htm>)
3. Descartes – The Principles of Philosophy, Part III, Sections 1-3
(<http://www.classicallibrary.org/descartes/principles/03.htm>)
4. Ferngren - Causation, Chapter 10, pp.130-141
5. Ferngren – The Mechanical Philosophy, Chapter 11, pp.143-151

******MID TERM ESSAY DUE******

Thursday 3/18: Newton I: The General Scholium

Assigned Reading:

1. Newton – General Scholium.pdf
 2. General Scholium Guide.pdf
 3. Ferngren – Isaac Newton, Chapter 12, pp.153-161
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Tuesday 3/23: Newton II: Mysticism and Religion

Assigned Reading:

1. Newton – Opticks.pdf, Book 3, pp.370-382
 2. McGuire – Newton and the Pipes of Pan.pdf
 3. Snobelen – Theology of the Scholium.pdf
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Thursday 3/25: Natural Theology and Darwin

Assigned Reading:

1. Ray – Wisdom of God.pdf
 - a. Preface, pp.vii-xi
 - b. Part First, pp.25-60
2. About John Ray - <http://www.ucmp.berkeley.edu/history/ray.html>
3. William Paley – Natural Theology Chapter I, pp.1-8 - <http://darwin-online.org.uk/content/frameset?itemID=A142&viewtype=text&pageseq=1>
4. Ferngren – Natural Theology, Chapter 13, 163-173
5. Ruse – Christianity and its Discontents, Chapter 1, pp.7-27

Recommended Reading:

1. Ferngren – Natural History, Chapter 15, 195-206

Darwin, Evolution, and Religion

Tuesday 3/30: Darwin I

Assigned Reading:

1. Darwin – On the Origin of Species (First Edition) - <http://darwin-online.org.uk/contents.html#origin> (download this pdf!)
 - a. Introduction, pp.1-7
 - b. Chapter 1, pp.17-29
 - c. Chapter 2, pp.50-56
 - d. Chapter 3, pp.60-65
2. Ferngren – Geology and Paleontology, Chapter 14, pp.179-192
3. Ruse – From Progress to Evolution, Chapter 2, pp.28-41

Thursday 4/01: Darwin II

Assigned Reading:

1. Darwin – Origin
 - a. Chapter 4, pp.80-95, 126-130
 - b. Chapter 6, pp.171-194
 - c. Chapter 9, pp.287-307
 - d. Chapter 10, pp.312-317
 2. Ruse – Charles Darwin, Chapter 4, pp.64-82
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Tuesday 4/06: Darwin III

Assigned Reading:

1. Darwin – Origin
 - a. Chapter 11, pp.346-356
 - b. Chapter 12, pp.388-410
 - c. Chapter 13, pp.411-420
 - d. Chapter 14, pp.459-480, 484-490
 2. Ruse – Failure of a Professional Science, Chapter 5, pp.83-102
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Thursday 4/08: Religious Responses to Evolution

Assigned Reading

1. Ruse – Christian Responses, Chapter 7, 129-145
 2. Ferngren - Evolution, Chapter 17, pp.219-231
 3. Ferngren – Evangelicalism and Fundamentalism, Chapter 20, pp.261-275
 4. Ferngren – Creationism since 1859, Chapter 21, pp.277-287
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Tuesday 4/13: Scopes Trial

******IN CLASS MOVIE: PBS American Experience's "The Monkey Trial."******

Assigned Readings:

1. Ruse – Population Genetics, Chapter 9, pp.168-189
 2. Ruse – Evolution Today, Chapter 10, pp.190-213
 3. Ferngren – The Scopes Trial, Chapter 22, pp.289-298
- ****IN CLASS MOVIE: PBS American Experience's "The Monkey Trial."******
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Thursday 4/15: Dover Trial I

Assigned Readings:

1. Ruse – Creation science isn't Science.pdf
2. Laudan – Science at the Bar.pdf

- a. NOTE: These first two articles are about a previous case that took place in the early 1980s about so-called 'creation science.' They should be very helpful for setting up the Dover trial.
 3. Court Records of the Dover Trial
(http://www.talkorigins.org/faqs/dover/kitzmiller_v_dover.html)
 - a. Plaintiff's Opening Statement
 - b. Defendant's Opening Statement
 - c. Kenneth Miller Direct Examination
 - d. Kenneth Miller Cross Examination
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Tuesday 4/20: Dover Trial II

Assigned Readings:

1. Court Records of the Dover Trial
(http://www.talkorigins.org/faqs/dover/kitzmiller_v_dover.html)
 - a. John Haught Direct Examination
 - b. John Haught Cross Examination
 - c. Robert Pennock Direct Examination
 - d. Robert Pennock Cross Examination
 - e. Michael Behe Direct Examination
 - f. Michael Behe Cross Examination
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Thursday 4/22: Dover Trial III

Assigned Readings:

1. Court Records of the Dover Trial
(http://www.talkorigins.org/faqs/dover/kitzmiller_v_dover.html)
 - a. Steve Fuller Direct Examination
 - b. Steve Fuller Cross Examination
 - c. William Buckingham Direct Examination
 - d. William Buckingham Cross Examination
2. Wedge Strategy.pdf

******FINAL EXAM ESSAY DUE FRIDAY, APRIL 30TH BY 2PM IN MY MAILBOX IN
CATHEDRAL OF LEARNING 1017******