

CONTROVERSIES IN THE MODERN LIFE SCIENCES

Biology 4305 A

Fall 2014

Wednesdays: 230-530pm
 Room CB 115
 Professor Jan Sapp
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 Office: Farquharson 306
 Office Hours: Wed 1:30-4:30 by appointment

This course develops students' skills in analyzing controversies within the life sciences and at the interface of the life sciences and society. Students develop experience in critical reading and writing, oral presentation and working in groups.

ASSESSMENT:

Two synopses (300 words each 12 pt, double-spaced) of one of the assigned readings for different weeks. To be submitted on the day of that assigned reading (**15%**).

Note: All written work is to be submitted in essay form with well-structured sentences and paragraphs. *10% will be deducted on all work that is late by one class day. No assignments will be accepted one week after due date without medical reason.*

Student presentations and class participation (20%). Each student will give a 10-minute PowerPoint presentation of his or her term paper, and **will be assessed on his or her individual presentation**. Students will lead class discussion of required readings for each class.

Up to 10% of final mark will be deducted for lack of class attendance and participation. 5% deducted for two classes missed; 10% for three classes missed.

Essay proposals (10%): One page: brief description of the topic and indicative bibliography. Due October 8

In-class test on lectures: (25%). November 12

Term paper (30%): 2000 words, double-spaced, 12 pt font. Students will be grouped together with a division of tasks on each topic dealing with a) the history of the concept and/or technology, b) when, why and how the controversy occurred, and c) what is at stake in the controversy: conceptual, social, political ethical, economic. While research projects within a group are meant to be cohesive, with little overlap, **each student will be assessed on his/her individual essay. Due December 3.**

Course readings: See the moodle for assigned weekly readings of articles. Lectures and test are based on Jan Sapp, *What is Natural? Coral Reef Crisis*, New York: Oxford University Press, 2009, in bookstore and on reserve.

Week 1: September 10 Introduction

Week two:

Sept 17: **Required reading:** Robert Merton, “The normative Structure of Science,” 1942. pp. 267-278, In Robert K. Merton, Ed. N Storer, *The Sociology of Science. Theoretical and Empirical Investigations*. Chicago: Chicago University Press, 1973

- Who was Robert Merton?
- What did he mean by Norms of science?
- What is the aim of science for Merton?
- What are the norms of science according Merton?
- Why are there virtually no frauds in science, according to Merton?
- What does Merton say in regard to ethnocentrism and science?
- What norms might be flagrantly abused in controversies- say over, global warming or over evolution and creationism?

Student presenters:

Required reading: S.B. Barnes and R.G.A. Dolby, “The Scientific Ethos: A deviant Viewpoint,” *European Journal of Sociology* 11 (1970): 3-25. Read pages 1-8.

- What are some of the corollaries of Merton’s norms?
- Do these corollaries hold up, in the view of Barnes and Dolby?
- Are Merton’s Norms “statistical” norms or “professed” norms, in their view? Why?

Student presenters:

Required Reading: Thomas Kuhn, *The Structure of Scientific Revolutions*, Princeton University Press, 1962, pp. 10-22, 35-51, 66-76.

See also wiki site on Kuhn and paradigms: http://en.wikipedia.org/wiki/Thomas_Kuhn

Class discussion questions:

- What is Kuhn’s concept of paradigm? Can you think of examples in biology?
- What does Kuhn mean by “normal science”? Provide examples in biology?
- How do scientific revolutions occur in Kuhn’s view? Think of some cases in biology?

Student presenters:

Week three: Establish group projects.

Sept 24: **Required reading** Bernard Barber, “Resistance by Scientists to Scientific Discovery,” *Science* 134 (1961): 596-602.

What are some of the reasons Barber offers for why scientists may resist new ideas? Give some examples.

Student presenters:

Required reading Stephen Brush, “Should the History of Science be Rated X?” *Science* 183 (1974): 1164-1172.

What did Stephen Brush mean by posing the question “Should the history of science be rated X?”

What is Whig history?

Did he believe that it should be rated X? Do you agree with him?

Student presenters:

Required reading Peter Medawar, “Is the scientific paper a fraud?” *Saturday Review*, 1 1964, 42-43; 6 mss pages.

What did Peter Medawar mean by posing the question is the scientific paper a fraud?

Do you agree with him?

What scientific method of reasoning is assumed by the structure of the scientific paper according to Medawar?

What is inductive reasoning? Give an example

What is deductive reasoning? Give an example

What is hypothetico- deductive? Give an example

What do Shapin and Schaffer mean by virtual witnessing?

Student presenters:

Required reading Michael Mulkey and Nigel Gilbert, “Accounting for Error: How scientists construct their social world when they account for correct and incorrect belief,” *Sociology* 16 (1982): 165-183.

What do Mulkey and Gilbert argue about how scientists account for error?

What do they mean by asymmetry?

What does this imply for studying controversies?

Week four:

October 1: workshop on projects.

Lectures:

Oct 8 What is Natural?
Oct 15 What is Natural?
Oct 22 What is Natural?
Nov 5 Test?

Student presentations

Nov 12

Nov 19

Nov 26

Dec. 3

Suggested Topics:

What led to the extinction of the Megafauna?
What is the origin of oil?
Stem cell research
Genetic screening and human genome
Gene therapy
Gene patenting
Transgenic organisms
Evolution-creation debate
On human origins
The sociobiology debate
Global warming and climate change