

STS 6534

[Cultural Studies of Science, Technology, and Medicine]

Blacksburg CRN 60998 – Durham 463

Falls Church CRN 61465 – NVC 103

Extended summer 2003

Thursdays 6:30 - 9:30 pm

METAPHOR IN SCIENCE, TECHNOLOGY, AND MEDICINE

ver. 1.0 *draft*

Go to Blackboard: <http://www.learn.vt.edu>, log in with VT PID and password

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Summary description

Seventeenth century natural philosophers sought a language for the new science that would be transparent to meaning, a language free of the obfuscations of metaphor, analogy, and other devices of Renaissance magical and religious rhetoric. In the last four decades, metaphors have been transformed from the "victimizers of scientists" to "cognitive instruments" and inescapable elements of the ways scientists and the rest of us conceive and construct the world. More recently, the developing cognitive science area of cognitive theory of metaphor has been arguing, with increasing empirical evidence, that metaphorical thinking is an unavoidable filter of our thought, including and especially in science and philosophy of science. Metaphors may play a special role in policy issues, shaping conflicting alternatives and blocking communication and compromise unless addressed explicitly. This work is just beginning to garner attention in STS.

Through a variety of historical case studies and theoretical statements focusing on the physical, biological, and social sciences, philosophy, policy, and key technologies such as the clock and the computer, the seminar will examine and assess claims about the pervasiveness and necessity of metaphor in Western science and technology. Depending on the interests of enrolled students, the seminar may include a section on metaphor in science and mathematics education.

Prerequisite: At least two STS core courses or seminars, or two appropriate graduate seminars in other fields, or permission of the instructor.

Readings include the following books, plus articles accessible online through the course website.

Paul N. Edwards, The closed world: Computers and the politics of discourse in Cold War America (1996)

George Lakoff and Mark Johnson, Philosophy in the flesh: The embodied mind and its challenge to western thought (1999)

Otto Mayr, Authority, liberty and automatic machinery in early modern Europe [clockwork metaphor] (1986)

Donald A. Schon and Martin Rein, Frame reflection: Toward the resolution of intractable policy controversies (1994)

Recommended books

Theodore L. Brown, Making truth: Metaphor in science [chemistry, biochemistry, global warming] (2003)

Evelyn F. Keller, Refiguring life: Metaphors of twentieth century biology (1995, 1996pb)

George Lakoff and Mark Johnson, Metaphors we live by (1980)

Andrew Ortony, ed., Metaphor and thought 2d ed. (1993; 1st ed., 1979)

Computer access requirements: Students should be familiar with web browsers, Adobe Acrobat Reader, listservs, and email, and all must have active email accounts and VT PIDs.

Discussion participation (30%): Assigned readings will be organized in such a way as to facilitate class familiarity with a wide range of topics and approaches. All students will complete reading assignments and participate knowledgeably in weekly synchronous and asynchronous discussions. By dinner-time Wednesday 24 hours before class, all students will post notes and commentary on the assigned readings, and questions/issues for discussion in the next evening's class. In addition, by the Monday following each Thursday evening class meeting, students will post to the appropriate part of the discussion area a paragraph-long evaluation of the class, which should address the following, as well as other relevant topics: in what ways the discussion went well or otherwise; how we all might work on improving the quality of subsequent discussions; topics or approaches we need to spend more time on; and, in the discussion area on the V-Tel technology, how we might modify the setup of the rooms to increase the transparency of the technology. The discussion area is located within the course website.

Discussion leading (10%): The class discussion will be led by a group of students drawn from both sites who will function as a team, preparing together in advance, posting notes and questions to the discussion area (as do all students), and conducting the synchronous discussion and its asynchronous follow up. Students will lead discussions on a regular basis, with the frequency of responsibility depending on the enrollment. Assignments will be made a week or two in advance, on a volunteer basis so long as equitable rotation is maintained. Absence of a discussion leader without arrangement for a substitute will result in a "0" for the missed presentation.

Short papers: Two short papers, each 5 pp max (double-spaced with normal margins), deploying and/or analyzing various approaches to metaphor in science, technology, and medicine/STS. Papers may be submitted electronically, as html (double spaced) mail, or as email attachments (.rtf files, .html (double-spaced) files, Acrobat .pdf files, or WordPerfect files, but NOT as MSWord documents).

- Paper 1 (20%) due during the week after class 4, no later than Monday 16 June. Topics TBA.
- Paper 2 (10%) a detailed prospectus for your research project, due in week 9, by Friday 18 July.

Research project (30%): An investigation of the deployment of metaphor in some particular field of science or technology or STS of interest to you, or in a particular document of professional interest. Many of the readings and guests will offer examples of approaches and frameworks. All students will present their research to the class in the last class meeting (7 August), and should post materials for class study not later than Tuesday 5 August. Completed final project papers are due not later than Saturday 9 August.

COURSE SCHEDULE

INTRODUCTION

Week 1
22 May
Introduction – course structure
Web information
Assign discussion leaders
Mutual introductions
Metaphors

Week 2
29 May
Early modern science and technology metaphors

Week 3
5 June
Beginning theory
Case studies

Week 4
12 June
More theory
More case studies

PAPER#1 DUE MONDAY 6/16

Week 5
19 June
Metaphors of/in biology

Week 6
26 June
Computers

Week 7
3 July
Medicine and the body

PAPER #2 RESEARCH PROSPECTUS DUE 11 JULY

READINGS

–Lakoff/Johnson, Philosophy in the flesh pt I, 3-129
–Martin, "The egg and the sperm: How science has constructed a romance based on stereotypical male-female roles"
–Look over one or two articles of interest from 'course documents' or 'external links'

–Arbib/Hesse, "Language, metaphor, a new epistemology"
–Bono, "The word of God, the book of nature, and the eclipse of the emblematic worldview" (skim)
–Eamon, "Science as a hunt"
–Mayr, Authority, liberty..., entire (skim ch 3, 9-10)

–Ortony, "Metaphor, language, and thought," in Ortony
–Young, "Darwin's metaphor: Does nature select?" ch 4 of Darwin's metaphor: Nature's place in Victorian culture
–Young, "Darwin's metaphor and the philosophy of science"
–Russell, "'Speaking of annihilation': Mobilizing for war against human and insect enemies, 1914-1945"

–Boyd, "Metaphor and theory change: What is "metaphor" a metaphor for?" in Ortony
–Kuhn, "Metaphor in science," in Ortony
–Gentner and Jeziorski, "From metaphor to analogy in science," in Ortony
–Bono, "Science, discourse, and literature: The role/rule of metaphor in science"
–Wise, "Mediating machines"

–Figlio, "The metaphor of organization: An historiographical perspective on the biomedical sciences of the early nineteenth century"
–Morus, "'The nervous system of Britain': Space, time, and the electric telegraph in the Victorian age"
–Kay, "Who wrote the book of life? Information and the transformation of molecular biology, 1945-1955"

–Edwards, The closed world: Computers and the politics of discourse in Cold War America, entire

–Morus, "The measure of man: Technologizing the Victorian body"
–Tauber, "Postmodernism and immune selfhood"
–Maasen, "Metaphors in the social sciences: Making use and making sense of them"

Week 8 10 July	Remaking philosophy of science	–Lakoff and Johnson, <u>Philosophy in the flesh</u> , shared
Week 9 17 July	Policy controversies	–Schon, "Generative metaphor: A perspective on problem-setting in social policy," in Ortony –Schon and Rein, <u>Frame reflection</u> entire
Week 10 24 July	Governance by metaphor project	Links on Blackboard
Week 11 31 July	Theory review: Can we synthesize one?	–Bono, "Locating narratives: Science, metaphor, communities, and epistemic styles" –McClellan, "The economic consequences of Bruno Latour" –Mokyr, "Evolution and technological change: A new metaphor for economic history?"
Week 12 7 August	RESEARCH PRESENTATIONS	

COMPLETED RESEARCH PROJECTS DUE SATURDAY 9 AUGUST