

Course Syllabus: “American Science and Nature”

Course Overview

This course views the history of American nature and the history of American science and technology as intimately related. The goal of the course is to come to an understanding of how we, throughout American history, have come to know nature (the rural environment, the landscape, the built-environment) through the use and means of science and technology. We will study the employment of S and T to *understand* nature, but also the use of S and T to *change* nature. Furthermore, we will ask questions about the definitions of nature that come from the sciences, and consider other ways Americans have known (perceived, interpreted, altered) their environment. We will integrate environmental history and history of science and technology materials with examples drawn from the visual arts, literature, and governmental policy. The premise of the course is straightforward – that American nature has played a significant role in defining American history and that science and technology have played significant roles in defining American nature.

Basic guiding questions

- What **is** nature? (Who gets to answer this throughout history?)
- What is the relationship of humans to nature? (How has the answer to this changed throughout history?)
- What roles have science and technology played in this? (And how did they – the various sciences and technologies – develop as part of the process of knowing nature?)
- How do answers to these questions fit into the context of American history?

Course Objectives

- To identify the prominent role the various sciences have played in helping us study nature over the past two centuries
[the main course readings will be geared toward this objective]
- To understand the role of nature in American history
[auxiliary readings and lecture material will help us with this one]
- To be aware of alternative ways to know, define, and interact with nature
[several readings, alternative sources, and some field trips will help us here]
- To figure out how these historical lessons can help you out in the present, to see your own place in history
[journal entries throughout the semester will help us coordinate the other objectives with this one]

Required Texts

Jefferson, Thomas (1787/1998) *Notes on the State of Virginia* (Penguin Classic) [ISBN: 0140436677] (\$11) [currently back-ordered from the publisher, which means it isn't at the local bookstores yet. However, it is available on-line:
<http://etext.lib.virginia.edu/toc/modeng/public/JefVirg.html> and/or
<http://www.yale.edu/lawweb/avalon/jevifram.htm>]

Russell, E. (2001) *War on Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (Cambridge Univ Pr) [ISBN: 0521799376] (\$21)

Carson, Rachel (1962) *Silent Spring* (Mariner Books: 40th Anniversary edition) [ISBN: 0618249060] (\$11)

Plus: Numerous miscellaneous readings (available either on the web, by hand out from me, or directly from the course Blackboard site)

Grades

30% **CLASS PARTICIPATION** (attendance, attentiveness, bringing questions to discussion, contributing to discussions, introducing ideas, concerns, problems, etc.)

10% **PRIMARY DISCUSSION QUESTION RESPONSIBILITY** (I'll explain this soon)

15% **JOURNAL** (entries made every one or two weeks)

15% **HOMEWORKS** (not that many, and usually meant to contribute to the current topic)

30% **ESSAYS** (3 of them; one will count as the final essay, the other two will be due throughout the term)

PART I: Describing American Nature, Developing American Science, Defining American Exceptionalism

MAIN ENVIRONMENTAL ISSUES: taking stock of unbounded natural wealth

Week 1 Introduction to the course: The task ahead: integrating American scientific and technological history with environmental history. What is nature? What is exceptionalism? What is science? What is technology?

Week 2 Jefferson's America: The state of science in the late eighteenth century. The second scientific revolution. The means to interact with nature. The reasons to understand nature. What about technology?

Reading: Thomas Jefferson (1787) – *Notes on the State of Virginia*: Queries 1-6 and 19

Due: Notebook Entry #1

PART II: Representations of American Landscape, Scientific and Otherwise

MAIN ENVIRONMENTAL ISSUES: living within nature, outside of it, harnessing it, defining it so that you can harness it, or not

Week 3 Literary, scientific, & artistic representations

Reading: Donald Worster (1973) – "Introduction" to *American Environmentalism*; Golinski (2003), "The Literature of the New Sciences"; Thomas Cole (1835) – "Essay on American Scenery"

- **Recommended readings:** W. B. Rogers: selections from *Reprint of the Report on the Geology of the Virginias*, on hold at Newman Library; Peter Bowler, selections from *The Norton History of the*

Environmental Sciences, on hold at Newman Library; David Nye, Introduction to *America as Second Creation*, on hold at Newman Library

Week 4 Geology and landscape: Visual, religious, & scientific representations coexisting

Reading: Rebecca Bedell – Selections from *The Anatomy of Nature*

- **Recommended reading:** Angela Miller -- selections, *The Empire of the Eye*, on hold at Art/Arch library

Due: Notebook Entry #2

Week 5 The naturalist's representation: (Essay #1 Due)

Reading: Henry David Thoreau (1851) – “Walking” and excerpts from “Faith in a Seed”; George Perkins Marsh (1860) – "The Pastoral Vision Refuted"

Week 6 Counter views: How is it that the so-called Romantic period was at the same time as the second Scientific Revolution (early 1800s)? Plus: institutionalization and professionalization – scientists, engineers, land-grant schools, and federal agencies.

Reading: Whitman, Poe, Emerson, Coleridge, Dickens, Blake, Giusti, Hawthorne

- **Recommended Readings:** Judith Major, *To Live in the New World* (1997), on hold at Newman Library; J.J. Audubon, excerpts; Jennifer Price, excerpts

Due: Notebook Entry #3

PART III: Nature is not Infinite: Forests, Waters, and Consuming Nature

MAIN ENVIRONMENTAL ISSUES: unending bounty drying up; frontier closing; not just describing or living within a natural order, but also controlling it and improving/engineering/molding it; enter Darwin

Week 7 Ecology and Biology: Do species go extinct? Can we be the cause of it? What is the human role in changing nature?

Reading: Stephen A. Forbes (1887) – “The Lake as a Microcosm”

- **Recommended readings:** Charles Darwin – selections, on hold at Newman Library

Week 8 Forestry and Wilderness: (Essay #2 Due) The conservationism v/ preservationism debate. What is it? Why does the debate matter? How does science fit into it? Is it all about values?

Reading: Gifford Pinchot (1910) – “The fight for conservation”; John Muir (1875) – “Wild Wool”; John Muir (1912) from *The Yosemite*

- **Recommended reading:** Frederick Clements – "Nature and structure of the climax,"

Due: Notebook Entry #4

Week 9 Nature, S, T, and Human Values: Human control over nature. Nature's control over humans. What about humans as part of nature? And what is technocracy, by the way?

Reading: Edmund Russell (2001) – *War and Nature* (first half)

PART IV: The Mechanical-Industrial Age: The sciences are in control or out of control? Technology is the solution, or the problem? (Plus: the watershed of WWII)

MAIN ENVIRONMENTAL ISSUES: environmental destruction; manipulating nature; benefits humanity, or not? New human/nature relationships

Week 10 Metaphors of Nature and Science: The Mechanical Age. Industry, Commerce, War, Modernism.

Reading: Edmund Russell (2001) – *War and Nature* (second half); plus, selections on Modernist art

Due: Notebook Entry #5

Week 11 Aldo Leopold and a New Ethic

Reading: Aldo Leopold (1949) – "Thinking like a mountain" and "The land ethic"

Week 12 Environmental Watershed: Physics, the Bomb, the future: would you "give your teeth for science"? Is your bomb shelter adequate? What are we afraid of? (Essay #3 Due)

Reading: Rachel Carson (1962) – *Silent Spring* (first half)

Week 13 Silent Spring.

Reading: Rachel Carson (1962) – *Silent Spring* (second half)

- **Recommended reading:** Thomas Hughes – selections from *American Genesis*; T.S. Eliot – selections from Eliot's poetry

Due: Notebook Entry #6

PART V: Epilogue: Where are we now?

MAIN ENVIRONMENTAL ISSUES: pollution, destruction, development, suburbia, global warming, machines, nuclear energy, radioactive fallout, river pollution, lake death, Love Canal, environmental justice, Bhopal, toxicity assessment, from little science to Big Science, our

technological age – is it post-industrial? Is it information? Is it genetic? But wait -- longer life, less pain, more security, increased luxury? Is it bad or good? (or that simple?)

Week 14

Choose a Reading:

- Selections on the modern Environmental Sciences from P. Bowler
- The EPA as a test case of science, technology, politics, and nature
- Issues in Environmental Justice – Love Canal, Three Mile Island, Bhopal, Woburn, Chernobyl
- Issues in Sociobiology
- Issues in Chaos Theory
- Issues in Biotechnology – genetic modification (animals), GMOs (plants), medical research...
- Willaim Cronon (1995) – “The Trouble with Wilderness”

Week 15 **Conclusions, wrap-up, and next steps.** Answering the ‘so what’ question: Final Essay Due