

MIT Program in Writing and Humanistic Studies/MIT Literature Faculty

21L448 (21W739J)
Darwin and Design
Fall 2002

Meetings: Two sessions / week
1.5 hours / session

Course Description. In the Origin of Species, Charles Darwin gave us a model for understanding how natural objects and systems can evidence design without positing a designer: how purpose and mechanism can exist without intelligent agency. Texts in this course deal with pre- and post-Darwinian treatment of this topic within literature and speculative thought since the eighteenth century. We will give some attention to the modern study of ‘feedback mechanisms’ in artificial intelligence. Our reading will be in Hume, Voltaire, Malthus, Darwin, Butler, Hardy, H. G. Wells, and Turing. **There will be about 100 pp. of weekly reading--sometimes fewer, sometimes more.**

We will concern ourselves mainly with four topics.

1. The first topic is William Paley’s problem: Does the existence of design (organized, self-sustaining, or self-reproducing systems) argue that there is a designer or organizer, an intelligent agency responsible for its creation?
2. The second topic is Daniel Dennett’s and John Searle’s problem: Can such allegedly ‘designed’ systems be credited with intelligence themselves?
3. The third topic concerns the place of Darwin’s Origin and his idea of Natural Selection in the course of debates on the first two problems.
4. The fourth topic is the implication of Darwin and Darwinism for ideas of nature and of mankind’s place therein, as well as collateral, and often independent, manifestations of such ‘undesigned’ worlds in literary texts.

The materials in this course offer a mixture of discursive and narrative texts dealing with a variety of evolutionary issues. In this class, we read what many thinkers and writers have had to say about one of the great human questions: how the realm we call ‘nature’ defines our existence. Your reading and discussion of authors who have considered this question will help provide you with a historical foundation for understanding a rich literary tradition, as well as many assumptions held by people in contemporary industrial cultures.

Format and Requirements. Class Format: Two 1.5 hour general meetings, with in-class discussion of readings and exploration of issues raised by them. Discussion will be our main means of exploring the class topic. Class participation will count. In order to promote discussion, I will also break the class down into small discussion groups from time to time. I expect every student to contribute to class discussions. Because most of our classes will be spent discussing the readings, keeping up with your reading is extremely important. This class has been designated a

communication-intensive class by the Hass-D Committee. The class will place additional emphasis on writing and speaking, with extensive revision of two of your essays (Nos. 2 and 4). The other two essays (Nos. 1 and 3) may be revised for a higher grade within one week after they have been returned to you. You will also be asked to give two short class presentations. Grades will be based on four 1-page summaries (10%), two short talks (10%), and four 5-page essays (80%). Class participation will be factored in to your final grade as a plus, minus, or neutral. Late papers will be penalized unless extensions are granted well in advance of the paper deadline. Extensions will not be granted except in emergency situations. Class attendance is required. There will be no final exam in the class.

Texts.

Photocopied distributions: Selections from

Aristotle, Physics.

The Bible: "Book of Genesis."

William Wordsworth, "Tintern Abbey."

William Paley, Natural Theology.

T. H. Huxley, Evolution and Ethics.

Charles Darwin, Descent of Man.

Essays by Von Neumann, Turing, John Searle, D. Dennett, on automatic machinery and artificial intelligence.

Books to purchase

Lewis Carroll, Alice in Wonderland.

David Hume, Dialogues on Natural Religion.

Voltaire, Candide.

Adam Smith, The Wealth of Nations.

Thomas Malthus, Principles of Population (1st ed).

Charles Darwin, On the Origin of Species (1st ed).

Samuel Butler, Erewhon.

Thomas Hardy, Tess of the D'Urbervilles.

Robert Louis Stevenson, Dr. Jekyll and Mr. Hyde.

H. G. Wells, The Time Machine.

Norbert Wiener, God and Golem.

Dianna Hacker, A Pocket Style Manual, 2nd edition. This short reference manual will serve as a class guide for writing and editing papers.

Class Schedule and Topics

Class #1. Introduction: Wordsworth's "Tintern Abbey."

Class #2. Carroll, Alice's Adventures in Wonderland. (**Writing assignment, 1 page, due in class:** write a 1-page descriptive summary of your favorite character in Alice.)

*Some reading topics for Alice's Adventures in Wonderland
[Read Chapters 1-5, 7-9, 11-12]*

1. What kind of 'nature' do the inhabitants of Wonderland live in?
2. How would you describe Alice's intellectual and emotional response to various situations in Wonderland? Does rationality 'work' in Wonderland? What is the role of nonsense in Wonderland?
3. In what ways, if any, does Wonderland resemble an evolutionary world? Do rudeness and confrontation have any survival value in Wonderland?
4. Why is Alice always trying to work out what the 'rules' of Wonderland are?

Class #3. Genesis; Aristotle, selections from the Physics. (**Writing assignment, 1 page, due in class:** summarize, using examples from contemporary times, Aristotle's 4 factors or causes.)

Some reading topics for Genesis and Aristotle's Physics

1. Do the inhabitants of Wonderland live in a 'nature' governed by Aristotelian 'chance' (Aristotle, Physics, pp. 20-30) or 'uniformity' (pp. 32)? Both? Neither?
2. If you were Aristotle living in Wonderland, how might you rewrite your characterization of the four factors or causes (pp. 26)?
3. Is the creation account in Genesis necessarily in conflict with an Aristotelian factor (causal) analysis?
4. What does Aristotle mean by a 'telic' world or nature (pp. 37)? Do you agree with Aristotle's 'tooth' proof for the telic view of nature (pp. 38)?
5. How does the idea of design apply to the world of Genesis? Wonderland? Aristotle's Physics?
6. Is Kenneth Miller's view of evolution in "Life's Grand Design?" more consistent with Genesis or Aristotle's Physics?

Class #4. Voltaire, Candide. (**Writing assignment, 1 page, due in class:** write a summary of the philosophy of Pangloss, Martin, or the Eldoradians.)

*Some reading topics for Voltaire's Candide
[Read Chapters 1-7, 13-21, 25-30]*

1. Is Dr. Pangloss an optimist or a fatalist?
2. Identify some of the targets of Voltaire's satire.
3. Compare the different views of life of Pangloss and Martin (Chap. 20).
4. If the worlds of Candide and Wonderland are both irrational, which kind of irrationality do you prefer, and why? Is an evolutionary world irrational?
5. Is there any sense in Candide that human progress is possible?

Class #5. Hume, Dialogues, (Parts 1-5). (**Writing assignment, 1 page, due in class:** write a summary of Cleanthes' great machine of the universe in Part 2 or Philo's example of the shipbuilder in Part 5)

Some Reading Topics for Hume's Dialogues
[Read Preface, Parts 1-5]

1. Hume's listener, Pamphilus, refers at the start of the *Dialogues* to the 'accurate philosophical turn of Cleanthes,' 'the careless scepticism of Philo,' and 'the rigid inflexible orthodoxy of Demea.' Whose position do you agree with most--that of Cleanthes (natural theologian), Philo (scepticism), or Demea (orthodoxy)?
2. How strong a case do you think Cleanthes makes in his description of the world as a great, wonderful machine of a supernatural being? (Chapter 2).
3. Is this case consistent with Cleanthes' earlier arguments that Copernicus and Newton have shown how God works through natural laws?
4. Which of the three discussants is closest to Aristotle's idea that nature is a 'telic' world? Which is closest to Wordsworth's vision of nature? Which discussant would feel most comfortable in Wonderland?
5. Is Cleanthes' argument about the eye in Part III convincing? Why?

Class #6. Hume, Dialogues, (Parts 7, 10-11).

Some Reading Topics for Hume's Dialogues
[Read Parts 5, 7, 10-11 (32 pp)]

1. Compare and contrast Philo's example of the ship and carpenter (Part 5) with Cleanthes' example of the great wonderful machine of the universe (Part 2).
2. What might Wordsworth have said to Philo's suggestion in Part 5 that the world may be the first rude essay of some infant deity who was ashamed of his job and ran away? What might Aristotle have said? What might the Mad Hatter have said?
3. What problem does Philo's vegetative world model solve (Part 7)?
4. In part 10, Demea mentions the 'perpetual war' of existence. Is he thinking about evolution?
5. What are Philo's four circumstances of evil? (Chapter 11).

Class #7. Paley, Natural Theology: Selections (Handout). (**Essay #1 due.** 5-pages.)

Some Reading Topics for Paley's Natural Theology.
[Read pp. 1-41]

1. Paley states that "There cannot be design without a designer" (pp. 9). In what sense is this true? In what sense false?
2. What is the point of the eye-telescope comparison, and how well does it work?
3. What is Paley's method of reasoning and what are its strengths and weaknesses?

4. *Why does Paley think God used contrivances to make Nature work? (pp. 39-41)*
5. *Why does the succession of plants and animals pose a special problem for Paley's argument and how does he deal with this problem? (pp. 49-55)*

Class #8. Adam Smith, Wealth of Nations:

Some Reading Topics for Adam Smith's Wealth of Nations

[Read Book 1, Chaps 1-3 (pp. 109-126); Book 3, Chap 4 (pp. 507-16)]

-----27

1. *Does the principle of division of labor have any applications to organic systems? What advantages might division of labor confer on organisms?*
2. *In what ways is Smith's "Oeconomy" a self-regulating system? Is it more like Cleanthes' great machine of the universe, or like Demea's vegetative principle? Or more like the mad tea-party in Alice?*
3. *What role does opportunism play in Smith's system?*
4. *Is Smith's Oeconomy compatible with Aristotle's idea that nature is a 'telic'?*
5. *What is Smith's conclusion concerning the role of the economy in the progress of nations?*

Class #9. Malthus, An Essay on the Principle of Population:

Some Reading Topics for Malthus's An Essay on the Principle of Population

[Read Chaps 1-3, pp. 7-31, Chap 9, pp. 60-65]

1. *To what extent, if any, do you think Malthus's concept of the "Natural Inequality" (p. 20) holds in an age of advanced technology? Does technology have the potential to eliminate the Malthusian predicament?*
2. *According to Adam Smith, self-interest drives the development of an 'economy' that benefits everyone by providing more opportunity. This self-interest could be argued to be 'instinctual,' un-self-conscious behavior. In Malthus's system, instinct, which may lead to the development of an economy, leads also to the production of excess population. Can the views of Smith and Malthus be reconciled?*
3. *Malthus introduces the term "Struggle for Existence" in Chapter 3 (p. 29). How does this term apply to his system? Is it used in any way that suggests evolutionary process?*

Class #10. Malthus, Principles of Population: (Essay #2 due. 5-pages.)

Some Reading Topics for Malthus's Essay on the Principle of Population

[Read Chaps 13, 14, 18-19]

1. *Malthus seems to view the human mind as a 'compound' entity. Compare the role of instinct in Malthus's Essay and Smith's Wealth? What does the compound nature of the*

mind in the Essay have to do with Malthus's rejection of Smith's view of human motivation?

2. In Chapter 18, Malthus suggests that the human mind arises out of the misery of the human condition. Do you agree? Why?

Class #11. Darwin, On the Origin of Species.

Some Reading Topics for Darwin's Origin

<i>[Read: Introduction</i>	<i>1-6</i>	<i>Summary Overview</i>
<i>Chapter 1</i>	<i>29-43</i>	<i>Artificial Selection</i>
<i>Chapter 2</i>	<i>44-45</i>	<i>Variation Under Nature</i>
<i>Chapter 3</i>	<i>60-79</i>	<i>Struggle for Existence]</i>

-----41

- 1. What reasoning is behind Darwin's strategy of talking first about "Variation Under Domestication"? (See, especially, pp. 30-31). What do humans select for?*
- 2. What are some of the problems of characterizing a 'species'?*
- 3. In Chapter III, "Struggle for Existence," Darwin talks about a 'web of complex relations' (pp. 73-75). In what ways does this web of relations affect the struggle for existence among individuals of the same species?*
- 4. According to Adam Smith, self-interest drives the development of an 'economy' that benefits everyone by providing more opportunity. Does this principle of an expanding economy benefiting everyone, work in a Darwinian economy?*
- 5. How is Natural Selection like Artificial Selection? How is it different?*

Class #12. Darwin, Origin, (continued) (**Essay #2** returned.)

Some Reading Topics for Darwin's Origin, second class.

[Read:

<i>Chapter 4</i>	<i>80-84, 87-90</i>	<i>Natural selection</i>
		<i>Sexual selection</i>
	<i>101-112</i>	<i>Circumstances favorable to natural selection</i>
		<i>Extinction</i>
	<i>116-125</i>	<i>Chart on divergence of Taxa (pp. 514-15)</i>
	<i>129-130</i>	<i>Order of Succession: the Tree Image</i>
<i>Chapter 5</i>	<i>131-133</i>	<i>Laws of Variation</i>
		<i>External conditions</i>
	<i>171-175</i>	<i>Difficulties of the Theory</i>
		<i>Absence of Transitional Varieties</i>
		<i>Organs of Perfection: The Eye</i>
	<i>185-91</i>	<i>Natura Non Facit Saltum</i>
	<i>194-95</i>	<i>Doctrine of Utility</i>
	<i>199-203, 206</i>	<i>Two Great Laws: Unity of Type; Conditions of</i>

Existence]

-----49

- 1. Discuss Darwin's personification of natural selection (pp. 83-4). Is there a fallacy in the way Darwin presents natural selection as an agent?*

2. Compare sexual selection with natural selection. Which version is stronger? What are some of the problems associated with sexual selection?
3. Why is divergence of character a problem for the formation of species? (pp. 111-112. What does divergence of character have to do with the Darwinian idea of 'place' or niche?
4. What issues does Darwin's discussion of "Organs of extreme perfection" raise? (pp. 186-88).
5. What does the Darwinian "Natura non facit saltum" refer to? (pp. 194). Are there any problems with this idea?

Class #13. Darwin, Origin, (continued); Descent of Man, (selections)

Some Reading Topics for Darwin's Origin and Descent, third class

[Read:

Chapter 7	207-210	Instinct
Chapter 10	312-321	Geological Succession

Appearance of New Species

	341-345	<i>Disappearance of Species</i>
		<i>Summary of Geological Succession</i>
Chapter 13	433-450	<i>The Natural System</i>
		<i>Morphology</i>
		<i>Embryology</i>

-----36

Chapter 14	484-490	Summary
------------	---------	---------

1. In what way is instinct like a physiological organ in Darwin's system?
2. What are some of the ways in which the topic of geological succession defines the spatial characteristics of evolution?
3. How does Darwin use the natural system of classification to support his theory?
4. In what ways does Embryology support Darwin's views?
5. What does Darwin say about humans and evolution?

Class #14. Butler, Erewhon. (**Revised Essay #2** due.)

Some Reading Topics for Butler's Erewhon

[Read pp. 39-44, 78-84, 92-100, 102-125 (Chaps 1,7,9-12)]

1. What explains the extraordinary 'beauty' of the Erewhonian people (Chap. 7, pp. 78 ff.).
2. In what ways do the Erewhonian 'straighteners' (pp. 104) resemble our psychologists?
3. Discuss the Erewhonian 'trial' system (pp. 112-117).
4. What are some of the targets of Butler's satire?
5. In what way does evolution contribute to the worldview of Erewhon?

Class #15. Butler, Erewhon (continued)

Some Reading Topics for Butler's Erewhon (2)
[Read pp. 137-47; 156-62, 189-97 (Chaps 15,17,22)]

- 1. In the Erewhonian musical banks chapter (Chapter 15, pp. 137-147), what elements of contemporary society do you think is Butler satirizing? What is the significance of the double system of currency? (p. 137)*
- 2. What is the role of Yudgrun in Erewhonian society? (Chapter 17, pp. 156-161). Is there a Yudgrun in our contemporary society?*
- 3. What is the attitude toward progress (see pp. 189-91) at the Colleges of Unreason?*

Class #16. Butler, Erewhon (continued).

Some Reading Topics for Butler's Erewhon (3)
[Read Chaps 23-25, pp. 198-226: The Book of the Machines]

- 1. What are some of the dangers the Erewhonians see in machine consciousness?*
- 2. How do the Erewhonians see machine evolution taking place?*
- 3. How will humans and evolved machines co-exist, in the view of the Erewhonians?*
- 4. How are machines extensions of humans, in the view of Erewhonians?*
- 5. Is Butler's argument about machine evolution plausible?*

Class #17. Stevenson, Dr. Jekyll and Mr. Hyde.

Some Reading Topics for Stevenson's Dr. Jekyll

- 1. Why does Hyde's appearance seem so shocking to Utterson (pp. 16-18)?*
- 2. To what extent do Hyde's personality traits draw on instincts all primates, including humans, share?*
- 3. Why does Jekyll find Hyde so fascinating? *
- 4. Are there any Darwinian interpretations we can place on the Jekyll-Hyde syndrome?*
- 5. What is the implication of the fact that a mere drug separates Jekyll from Hyde?*

Class #18. Huxley, Evolution and Ethics. (**Essay #3 due.**)

Some Reading Topics for Huxley's Evolution and Ethics
[Read pp. 1-45]

- 1. Huxley speaks of the State of Nature (Section 1, pp. 1-5) and the Human State of Art (Section 2, pp. 9-11), and the two in a state of conflict with each other (Section 3, pp. 11-13). Is this a valid way of thinking of the human relationship with its conditions of existence?*

2. *What are some of the implications of Huxley's analogy of human culture and the colony (Section 5, pp. 16-17).*
3. *On pp. 20, Huxley states that humans compete in evolutionary terms not by struggling with each other but by controlling their conditions of existence. What are the implications of this human strategy?*
4. *In Section 7 (pp. 20-21), Huxley identifies the serpent in the human Garden of Eden. What is the serpent and how integral a part of human existence is this force?*
5. *In Section 10 (pp. 26-30), Huxley expands on the human condition as one in which humans carry within themselves the seeds of their own destruction. Does this view share anything with the view of Voltaire in Candide? How is Huxley's view different than that of Voltaire?*

Class #19. Hardy, Tess of The D'Uberilles .

Some Reading Topics for Hardy's Tess of the d'Uberilles (1)
[Read pp. 1-128 (Chapters 1-24)]

1. *Describe the role or presence of nature in Hardy's settings. How does Hardy's sense of nature compare with that of William Wordsworth in "Tintern Abbey"?*
2. *Are there any parallels between the efforts of Tess and Alice (in Alice in Wonderland) to understand the way the social code works?*
3. *What is the significance of the hay-trusser's dance in the barn at Chaseborough (Chapter 10)? Compare this scene with that of Tess in the garden in the mists of pollen (Chapter 19).*
4. *Describe Angel Clare's personality. How does he contrast with Alec d'Uberville?*

Class #20. Hardy, Tess, (continued)

Some Reading Topics for Hardy's Tess of the d'Uberilles (2)
[Read pp. 129-253 (Chapters 25-44)]

1. *Compare the Clare family (chap 25) with the Durbyfields (chap 3).*
2. *Describe Angel's attitude toward Tess (Chap 29-30). In what way does she conform to his ideal?*
3. *In Chap 34, in which the two newly-marrieds confess to each other, how do the two 'sinners' compare to each other in terms of guilt?*
4. *Discuss the symbolism of the dying pheasants in chap 51.*

Class #21. Hardy, Tess, (continued)

Class #22. H. G. Wells, The Time Machine. (Essay #4 due. 5 pages)

Some Reading Topics for H. G. Wells, The Time Machine

-
1. Compare the utopian visions of Wells and Butler. Both use evolutionary themes, but in very different ways.
 2. Could human society regress in the way that Wells suggests in his characterization of the Eloi and Morlocks?
 3. Are the Eloi and Morlocks reminiscent of Stevenson's *Jekyll and Hyde* in any way?
 4. Is Wells's novel an illustration of Huxley's Evolution and Ethics?

Class #23. Turing, Searle, Dennett, essays on computers (Essay #4 returned.)

Class #24. Turing, et al., continued.

Class #25. Wiener, God and Golem, Inc., selections. (**Revised Essay #4 due.**)

Some Reading Topics for Wiener's God & Golem, Inc.
[Read pp. 1-69]

-
1. Do you agree with Wiener's definition for machine learning on pp. 14?
 2. What does Wiener mean by phylogenetic learning? (pp. 13, 27-28). How does this kind of learning compare with individual (ontogenic) learning?
 3. What do machines and organisms have in common in respect to reproduction? (pp. 45-48)?
 4. What point about technology is Wiener trying to make with his tale of the Monkey's Paw? (pp. 58-60)
 5. Are there purposes expressed by technological operations that conflict with human purposes? (pp. 64-65).

Note: This Hass-D subject does not have a 3-hour final exam.

Writing Assignments:

Essay #1 Due in class #7

Topics for First Paper

Your first paper is due in class #7 and should consist of five typed pages (250-300 words/page). Your paper should be double spaced and printed. Be sure to give it a title.

The topics below are meant to be suggestive. Feel free to modify them or to invent a topic of your own. The object of your paper should be to discuss one or more of the texts we have read so far this term. Your paper should deal with issues relevant both to the text and to the subject matter of our discussions in class.

Please remember that you are writing an essay, not a book-report. An essay should furnish some reminder of the book's contents in the context of an argument about those contents. The evidence you use to back up your arguments should be quotations from the works you have read.

Your essay should have an introductory paragraph with a *thesis or problem statement* and an overview of the scope of the essay. This introductory paragraph should be followed by a series of paragraphs that develop your thesis. Each paragraph should have a major topic and series of supporting sentences. Your sentences should be written in a clear, direct, and economical style.

Suggested topics:

1. Many commentators on Hume's Dialogues have held that Philo, the skeptic, wins the debate, despite the fact that the narrator says that Cleanthes spoke best. Of the three main characters, whom do you think has the most convincing arguments? Outline your reasons for thinking this way.
2. In Wordsworth's Tintern Abbey, Nature is imagined as being in a deeply sympathetic bond with the poet, and, by extension, all sensitive individuals. But, in Candide, Nature is destructive and unyielding. Comparing and contrasting specific elements in the two works, decide whose version of nature you feel is most authentic.
3. The Dialogues begins with a discussion of the appropriateness of the dialogue form in certain topics. What is gained or lost by Hume not addressing his reader in his own first person ("I think that . . .")? Some commentators have compared the dialogue form with experimental prose? Can you build a case for the Dialogues as an experiment in philosophical speculation?
4. A related question may be raised about Candide. Voltaire is obviously a satirist, pushing a point of view on a number of topics, yet he chooses to write a narrative rather than speak directly in his own person ("I think that . . ."). Develop a thesis on what is gained or lost by Voltaire's using a narrative to state his position? Can you state what Voltaire's own position is?
5. Pangloss and Philo each speak extensively on "the problem of evil" (i.e., Where did evil come from? How is it to be understood?) Develop a thesis that compares and/or contrasts their views on at least one point related to this issue.
7. After exploring Aristotle's reasons for claiming that nature is 'telic,' evaluate how well Alice in Wonderland and Candide demonstrate worlds in which nature is telic.
8. Compare Alice and Candide as books about education. What Rules does the novice in Wonderland need to learn? What rules does the novice in Candide need to learn? Develop a thesis and discussion on the role and status of learning in the two works.
9. Using Hume's Dialogues as your model, develop a philosophical discussion between Alice and Candide that explores Philo's four circumstances of evil. Be sure that Alice and Candide use examples from their own worlds to buttress their respective arguments.

10. A theodicy is an argument confronting the view that evil exists with the view that the universe was created by an omnipotent, benevolent deity. Develop a thesis that compares the theodicy of Cleanthes with the view of the Turkish philosopher at the end of Candide.

Essay #2 Due in class #10

Topics for Second Paper

Your second paper is due in class #10 and should be 5 typed pages (figure 250-300 words/page). The following topics and questions are meant to be suggestive. Feel free to modify them or to invent a topic of your own. The object of your paper should be to discuss one or more of the texts we have read so far this term. Your paper should deal with issues centrally relevant both to the text and to the subject matter of our discussions in class.

Please remember that you are writing an essay, not a book-report. An essay should furnish some reminder of the book's contents in the context of an argument about those contents. The evidence you use to back up your arguments should be quotations from the works you have read. Your essay should have an introductory paragraph with a thesis or problem statement and an overview of the scope of the essay. This introductory paragraph should be followed by a series of paragraphs that develop your thesis. Each paragraph should have a major topic and series of supporting sentences. Your sentences should be written in a clear, direct, and economical style.

Suggested topics:

1. Adam Smith argued that the general interest of society was better managed by just letting things happen, without conscious direction of economic policy, than when philanthropic or benevolent interests were put deliberately to work. In other words, Smith believes that the best motivation is enlightened self interest. Develop a thesis about Smith's principle of enlightened self interest and test your thesis in the context of Malthus's Essay, Hume's Dialogues, or Voltaire's Candide.
2. Malthus applied the principle of population (pp. 20 of our edition) both to plants and to animals. But the bulk of his argument seems to apply only to humankind, since it is humans who increase geometrically, while their food supply (plants and animals) increases only arithmetically. Develop a thesis and argument about whether or not there is a contradiction in Malthus's views?
3. According to Adam Smith, when everyone tries to serve his or her interests, the result is that the actions of all, taken together, necessarily enhance the annual revenue of the society; to use his famous metaphor, one is 'led by an invisible hand to promote an end which was no part of one's intention,' namely, the good of society, and to do this better than if one actually tried to do it. How does Adam Smith account for this?

4. David Hume, in the person of Philo, may have anticipated and disposed of Paley's argument from design more than a quarter of a century before Paley offered it. On pp. 28-30, Paley offers an account of God as the mechanic or (as we would say) engineer, who designs things by acting in accordance with laws that he didn't discover. Does it matter that in Paley's argument, God the mechanic is also the creator of such laws? Discuss the pros and cons of Paley's view.
5. Which is more appropriate as the set of principles that underlies the world of *Candide*: Philo's four circumstances of evil or Cleanthes' discussion of the great machine of the universe? Develop a thesis and defend it with examples.
6. Adam Smith, writing twenty-two years before Malthus, seems to be saying something very like Malthus on pp. 181-83 (Penguin edition; the chapter entitled "The Wages of Labour") when he says that no species can multiply beyond its means of subsistence and that scarcity of means regulates the production of men as it does any other commodity. Yet Smith does not reach Malthus's gloomy conclusions. How does he avoid them? Is there anything about the "division of Labor" (which Malthus never mentions in the first edition of his *Principles*) that makes a difference to the argument?
7. To what extent, if any, do you think Malthus's concept of the "Natural Inequality" holds in an age of advanced technology? Does technology have the potential to eliminate the Malthusian predicament?
8. According to Adam Smith, self-interest drives the development of an economy that benefits everyone by providing more opportunity. This self-interest could be argued to be 'instinctual,' un-selfconscious behavior. In Malthus's system, instinct, which may lead to the development of an economy, leads also to the production of excess population. Develop a thesis about whether or not the views of Smith and Malthus can be reconciled?
9. Develop a thesis and then compare and contrast Philo's example of the the vegetative principle with Adam Smith's ideas of the development of an economy.

Essay #3 Due in class #18

Topics for Third Paper

Your third paper is due in class #18 and should be 5 typed pages (figure 250-300 words/page). The following topics and questions are meant to be suggestive. Feel free to modify

them or to invent a topic of your own. The object of your paper should be to discuss one or more of the texts we have read so far this term. Your paper should deal with issues centrally relevant both to the text and to the subject matter of our discussions in class.

Please remember that you are writing an essay, not a book-report. An essay should furnish some reminder of the book's contents in the context of an argument about those contents. The evidence you use to back up your arguments should be quotations from the works you have read. Your essay should have an introductory paragraph with a thesis or problem statement and an overview of the scope of the essay. This introductory paragraph should be followed by a series of paragraphs that develop your thesis. Each paragraph should have a major topic and series of supporting sentences. Your sentences should be written in a clear, direct, and economical style.

Suggested topics:

1. Darwin writes: "I use the term 'Struggle for Existence' in a large and metaphorical sense . . ." (p. 62). What are some of the ways he uses this phrase? Does Darwin's view of struggle differ from that of Malthus? Develop a thesis and write about what Darwin's phrase implies about Darwin's concept of nature?
2. How strong is the analogy between Adam Smith's "invisible hand" and the description of natural selection given on pp. 84 of the Origin, where we are told that natural selection "is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working . . . at the improvement of each organic being . . ."? Develop a thesis and examine some of the ways in which Darwin's idea of design in nature resembles (or differs from) Smith's idea of design in the economy.
3. Compare the theodicies (i.e. the justifications of God's goodness) in Malthus and Darwin, showing how they elevate the idea of a designed universe.
4. Taking a direct cue from Paley's discussion of the eye and the telescope (pp. 14-30 in Natural Theology), Darwin examines 'organs of extreme perfection' in the Origin, including the eye (pp. 185-89, 201-206). Examining the two texts, develop a thesis about the views of Paley and Darwin with regard to the eye. One of the issues here is the idea of *perfection*.
5. Taking up the taxa chart on pp. 514-15 of the Origin as your start, examine some of the ways this scheme of upward branching is used to conceptualize evolutionary process (see pp. 116-126, 331-333, 420-422). Develop a thesis about Darwin's visualization of evolutionary processes, and then discuss Darwin's taxa chart scheme in terms of the tree metaphor that Darwin invokes as an image of life (pp. 129-130).
6. Examine the emphasis given to accidental causes in the world of Candide and The Origin. Develop a thesis about how ideas of causality are expressed in these different worlds. What do Voltaire's and Darwin's ideas of causality tell us about the way that reality may be *designed* or *constructed*?
7. From Darwin's The Descent of Man:
The advancement of the welfare of mankind is a most intricate problem: all ought to refrain from marriage who cannot avoid abject poverty for their children; for poverty is not only a great evil, but tends to its own increase by leading to recklessness in marriage. On the other hand, . . . if the prudent avoid marriage, whilst the reckless marry, the inferior members tend to supplant the better members of society. Man, like every other animal,

has no doubt advanced to his present high condition through a struggle for existence consequent on his rapid multiplication; and if he is to advance still higher, it is to be feared that he must remain subject to a severe struggle. Otherwise he would sink into indolence, and the more gifted men would not be more successful in the battle of life than the less gifted. Hence out natural rate of increase, though leading to many and obvious evils, must not be greatly diminished by any means. There should be open competition for all men; and the most able should not be prevented by laws or customs from succeeding best and rearing the largest number of offspring.

Darwin deals here with the issues raised by Malthus. Develop a thesis and compare Darwin and Malthus in some detail on their social views. Darwin seems to advocate a laissez-faire (leave things alone) policy, unconstrained by legal or moral principles, in the production of offspring. Is Darwin's view more sensible than or simply the same as Malthus's?

8. Erewhon is "nowhere" spelled backwards, with a slight concession ease of pronunciation. To what extent is the social system of Erewhon a Darwinian system? What are some of the targets and how well does Butler's the technique of satirical reversal Butler work? In what ways do Butler and Voltaire differ as satirists?

9. The judge in Butler's Erewhon speaks in condemnation of the man whose wife had died: "You have suffered a great loss. Nature attaches a severe penalty to such offenses, and human law must emphasize the decrees of nature." In the same way, Erewhonians regard luck, health, success (or their opposites, ill-fortune, disease, failure), as if they were ethical attributes, and criminality as non-ethical, something that can be pitied or ameliorated. What is the underlying distinction between the ethical and the non-ethical at work here? Is the Erewhonian system of justice consistent?

10. If the object of society is the establishment of a stable, predictable code upon which individuals may depend, what are the comparative merits of Voltaire's Eldorado and Butler's Erewhon? What does the principle of Yudgrun contribute to stability in both these worlds?

11. Butler presents two views of mankind's relation to machinery in "The Book of the Machines." In one view, humans and machines are separate 'organisms' and therefore in competition for the same resources and spaces. In another view, machines are extensions of human functionality and therefore incorporated as part of humankind. Are these two views of machines opposed? Can you think of examples in our day to illustrate your views?

12. Like Paley, the writer of Butler's "Book of Machines" compares the eye to the microscope and the telescope (the little and big "see-engines"). He writes: "What is man's eye but a machine for the little creature that sits behind in his brain to look through?" The word 'machine' here should not disturb us; it means 'contrivance.' But what of the 'little creature'? If there is a little creature that uses the eye to look through, what does the little creature see with? Starting with this question, compare the various papers on computer intelligence distributed this term. Does a machine or contrivance always serve a purpose? If human beings are composed of machines or contrivances, and if the human brain is also a contrivance (as Butler hints in the paragraph after the one just cited), what is the entity to which it performs a function or a service?

Essay #4, Due in class #22

Topics for Fourth Paper

Your fourth paper is due in class #22 and should consist of five typed pages (250-300 words/page). The following topics and questions are meant to be suggestive. Feel free to modify them or to invent a topic of your own. The object of your paper should be to discuss one or more of the texts we have read so far this term. Your paper should deal with issues centrally relevant both to the text and to the subject matter of our discussions in class.

Please remember that you are writing an essay, not a book-report. An essay should furnish some reminder of the book's contents in the context of an argument about those contents. The evidence you use to back up your arguments should be quotations from the works you have read. Your essay should have an introductory paragraph with a thesis or problem statement and an overview of the scope of the essay. This introductory paragraph should be followed by a series of paragraphs that develop your thesis. Each paragraph should have a major topic and series of supporting sentences. Your sentences should be written in a clear, direct, and economical style.

Suggested topics:

1. Like Paley, the writer of Butler's "Book of Machines" compares the eye to the microscope and the telescope (the little and big "see-engines"). He writes: "What is man's eye but a machine for the little creature that sits behind in his brain to look through?" Is there a little creature that uses the eye to look through? If human beings are composed of machines or contrivances, what is the entity that they serve? Is that entity the same entity that drives an automobile down Massachusetts Avenue?
2. Wells's The Time Machine seems to accept Huxley's viewpoint in Evolution and Ethics. Hardship and struggle, foster the human capacity for intelligence (recall Malthus, too). To put this in Huxley's terms, natural selection, in producing humans, has produced something that opposes the work of natural selection in favor of cooperation and the use of natural forces for the benefit of the human species. Paradoxically, however, intelligence, by removing the need for struggle, may remove the selective advantage of intelligence. Hence, the existence of Eloi and Morlocks, neither of which are very intelligent or cultured. Has intelligence thus led to the victory of the cosmic process over intelligence and culture, which seem to be missing in Wells's futuristic world? Develop a thesis and then comment.
3. "All the ethical points made by Huxley are present in The Time Machine but translated into vision." This statement (by the critic J. P. Vernier) is a commonplace of observation about Wells's "scientific romance." Comment by comparing selected aspects of the two books.
4. Both Wells and Stevenson write stories about self-division, in which two sides of human nature are conceived as separable. In one case (Stevenson), the separation is effected at a social, perhaps organismic, level; in the other (Wells), the two sides are given independence of the composite self that is humankind. In both, however, the active, creative side of the self is associated with darkness and evil. Develop a thesis and then comment.
5. In various ways, Huxley and Wells modify the idea of 'perfection,' a term used in various ways by Darwin. As Huxley points out (and Wells implies), although the process of natural selection may be said to perfect things, it does so only in relationship to the particular situation of a given

species--its particular conditions of existence. Can you imagine conditions in our contemporary times, therefore, under which 'perfection' by the standards of natural selection would be 'degeneration' by human standards of ethics or culture? That is, can conditions arise in contemporary society in which non-ethical, anti-cultural norms of human behavior are adaptive?

6. Using one or more of the books we have read, develop a thesis about the relationship of 'progress' and 'evolution.'

7. Compare the integrative role of convention in Erewhon, Dr. Jekyll, and Evolution and Ethics. Develop a thesis and then comment.

8. The question, "Can computers really think?" may be regarded as another version of the question, "Does nature really select?" Is the parallel valid? How far does the parallel go?

9. In his God and Golem, Norbert Wiener discusses the problem of *Homeostasis* in terms of the relationship between humans and the machine (see Chapter 6). Is this problem related in any way to the problem of the human-machine relationship alluded to in Wells's The Time Machine ?

10. Discuss the problem of magic, operationalism, and cybernetic control, as it is developed in God and Golem. How does this problem relate to problems of social and instrumental design? The tale of The Sorcerer's Apprentice is relevant here.

11. From God and Golem:

No, the future offers very little hope for those who expect that our new mechanical slaves will offer us a world in which we may rest from thinking. Help us they may, but at the cost of supreme demands upon our honesty and our intelligence. The world of the future will be an ever more demanding struggle against the limitations of our intelligence, not a comfortable hammock in which we can lie down to be waited upon by our robot slaves.

Comment. Does Wiener's observation support Huxley's conclusion in Evolution and Ethics?

12. From God and Golem: "A hen is merely an egg's way of making another egg" (p. 36). Discuss.

13. Write about evolution as a learning process.