

## **Darwin's Legacy in the 20th Century and Beyond**

John Rommereim, Instructor

Fall, 2000

The goals of this course are: 1) to develop your skills in the areas of critical thinking, writing, and oral communication. 2) to integrate you fully into the college environment by providing you with advice regarding your course of study and other necessary assistance. Although the subject matter is expansive and interesting in its own right, we should remember that the readings are not an end to themselves, but are intended to be a springboard to facilitate the development of your skills.

We will consider the impact of Darwin's thought in four areas: 1) the relationship between science and religion, 2) the question of design in nature, 3) current scientific understanding of the origin of life on earth (and related questions regarding extra-terrestrial life), and 4) application of Darwin's ideas to questions regarding human nature. For each reading assignment, you will be given a set of study questions. The questions are intended to help you read more actively and to absorb the material more fully. You should come to class prepared to answer the questions. The more thoroughly you are prepared for class, the more fruitful and interesting our discussions are likely to be. At various times, you will also be asked to submit questions to the internet discussion forum, and to submit responses to other students' questions.

In addition to discussion of the regular readings, we will set aside a few minutes of each class session for short studies in grammar and logic. For the most part, these short units will rely on mini-lectures and handouts, so they won't require homework preparation. Toward the end of the semester, we will apply what we have learned as we evaluate the arguments given in various writings.

### Grading:

Written assignments: 60%

Oral presentations 15%

Leadership of Discussions 15%

Class participation 10%

### Required texts:

*Rocks of Ages*, by Steven Jay Gould

*The Portable Darwin*, Edited by Duncan M. Porter and Peter W. Graham

*Woe is I*, by Patricia T. O'Conner

### Schedule

Thursday, August 24

8:30 a.m. library session with Cecilia Knight

Meet at the Burling Library Computer Room (basement)

(Rommereim out of town)

Assignment: Read the "Introduction to the Topic" attached at the end of this syllabus.

Paper 1 due: 1-2 pages. Read Robert Frost's poem, "I found a dimpled spider." Answer the question, "What does this poem say about design in nature?"

Tuesday, August 29

Read *Rocks of Ages*, pp. 1-45.

"A Tale of Two Thomases" Study questions: 1. What approaches to NOMA do the two Thomases (doubting Thomas and Thomas Burnet) illustrate? 2. How, according to Gould, can Thomas's doubts be problematic in a religious context? 3. How does Burnet employ the metaphor of the gordian knot when discussing the role of miracles in the history of the world? 4. In what sense was Burnet's wacky theory scientific? 5. In what way does Gould hope to change our understanding of Burnet's role in the history of science?

"The Fate of Two Fathers" Study questions: 1. How would you characterize Darwin's attitude toward religion, judging from the excerpt from his letter to Asa Gray (p. 35)? 2. What is the "whole subject" to which Darwin refers on the top of p. 36 ("I feel most strongly that the whole subject is too profound for the human intellect.")? 3. Describe the various conflicting impulses evident in the letter. 4. How can the quotation from Huxley's letter on p. 42 be seen as a defense of "true religion"? 5. Describe Huxley's approach to the question of the immortality of the soul. Grammar study: Chapter 1 of *Woe is I*, "Therapy for Pronoun Anxiety"

Thursday, August 31

Individual meetings to discuss papers: no class meeting

Read Gould, pp. 47-96

"NOMA Defined and Defended" Study questions: 1. How does this quotation fit into Gould's argument: "Art is limitation. The essence of every picture is the frame." (What is being limited?) 2. Why does Gould refrain from identifying the second NOMA (introduced on the bottom of p. 54) exclusively with religion? 3. What constitutes "real success" in life, according to Gould (p. 58)? 4. Why was Huxley offended by the statement from the Anglican burial service, "If the dead not rise again, let us eat and drink, for tomorrow we die?" 5. What are the two implications that could potentially show partiality on Gould's part against religion? 6. Explain this statement: "So let us acknowledge the necessity and centrality of dialogue within this magisterium (on vital questions science cannot touch), and not quibble about the labels." (What are the labels about which we might quibble?) 7. Why is the inaccessibility of absolute resolution in ethical/religious questions not a flaw? 8. How does the distinction between "inherent logic" and "historical reality" figure into Gould's overall argument. 9. Explain Gould's fractal metaphor. Name other examples of things that are "utterly inseparable but utterly different."

"NOMA Illustrated" Study questions: 1. What approach does Gould recommend when one is dealing with extremists? Why? 2. What is the overall point that Gould is trying to make in this chapter? 3. How does he organize his argument? 4. What evidence does Gould offer that the Catholic church "acknowledges the prerogatives of science for the most contentious of all subjects?" 5. How does *Humani Genris* support Gould's thesis of NOMA? How does it violate NOMA? 6. What limitation does NOMA impose on concepts of God? What limitations does it

place on scientists? 7. Describe the discussion of the biblical days of creation between Newton and Burnet. How did Newton use the birds and fishes of Greenland to refute Burnet's argument regarding the length of biblical days? 6. How does this story of Newton and Burnet's dispute advance Gould's argument? "Coda and Segue" 1. What are the requirements imposed by NOMA that are "difficult for many people?"

Tuesday, September 5

Read Gould, pp. 97-124

Write one question for discussion. Submit the question to the Discussion website by 7:30 a.m.

"The Contingent Basis for Intensity" Study Questions: 1. Explain Gould's usage of the analogy of the ice on the Neva river. 2. How, according to Gould, has White been misinterpreted? 3. Briefly, in your own words, list the four reasons for NOMA's beleaguered status in history. 4. How can science and religion avoid a trench-warfare sort of relationship? (imagery of final paragraph)

"Columbus and the Flat Earth: An Example of the Fallacy of Warfare Between Science and Religion" Study Questions: 1. How does the example of the false story of belief in a flat earth advance Gould's argument? 2. What is the value, according to Gould of a "little example?" In your view, does Gould's writing style on the whole conform to this suggestion and successfully circumvent "tendentious waffling?" 3. How was the timing of the propagation of the flat earth myth propitious? 4. How does Gould explain the extremism of Draper and the First Vatican Council? 5. How does the flat earth myth (the false story of the church's prolonged advocacy of a flat-earth cosmology) relate to a "false dichotomization" of Western history?

Grammar study: *Woe is I*, chapter 2, "Plurals before Swine."

Thursday, September 7

Read Gould, pp. 125-170.

Write one question for discussion. Submit the question to the Discussion website by 7:30 a.m.

"Defending NOMA from Both Sides Now: The Struggle Against Modern Creationism" Study questions: 1. What does Gould appreciate about Jehovah's witnesses? 2. Why does Gould assert the creationism issue is not about a war between science and religion? 3. What does Gould suggest to be the source of the literalist religious tradition in the U.S.? 4. How is the conventional view of the Scopes trial distorted? 5. How was the overturned Scopes conviction a defeat for the ACLU? 6. How did creationist strategy change after the Arkansas ruling in 1968? 7. How does the 1914 textbook *A Civic Biology* violate NOMA? 8. What was Bryan's three-fold error? How does it violate NOMA? In what way is Bryan's opinion traceable to errors on the part of the scientific community? 9. How can Bryan's antipathy to Darwin be seen as a case of "blaming the victim?"

Grammar study: *Woe is I*, chapter 3, "Yours Truly."

Tuesday, September 12

Read Gould, pp. 171-222

Write one question for discussion. Submit the question to the Discussion website by 7:30 a.m.

"Can Nature Nurture Our Hopes" Study questions: 1. What is the ultimate violation of NOMA? 2. How does Gould refute the notion that humans are the lords of nature? 3. What is the problem with the "all things bright and beautiful" point of view? 4. How did Lyell argue that

'noxious insects' were evidence of divine providence? 5. In your opinion, is Gould essentially arguing for atheism (or at least agnosticism) in this chapter? 6. Do you agree with Gould that humans have no special place in nature? 7. How does Huxley suggest that we can gain moral insight from nature? 8. In the letter to Asa Gray quoted on p. 203, what essential attribute of nature causes Darwin to question design? 8. In your view, is Frost's poem, "I found a dimpled spider" essentially a refutation of design in nature? 9. In your view, is the "cold bath" view of nature incompatible with a religious sensibility?

"The Two False Paths of Irenics" Study questions: 1. What errors, according to Gould, do zealous atheists tend to commit? 2. What problems does Gould perceive in a "syncretic" approach? 3. What is the logical flaw in the quantum physics argument for the simultaneous divinity and humanity of Jesus? 4. What problems does Gould see in the argument that the big bang accords "neatly enough" with Genesis? 5. Why does Gould object to reading religious implications into the anthropic principle?

Grammar study: *Woe is I*, chapter 4, "They Beg to Disagree"

Thursday, September 14

Panel discussion: Are science and religion incompatible?

Tuesday, September 19

Paper 2 due

Thursday, September 21

Read *The Portable Darwin*, pp. 105-136

Study questions: 1) Why are "external conditions" an insufficient explanation for how the diverse species of the world have arisen? 2. How do the ideas of Malthus aid Darwin in solving this question? 3. What are the problem areas for his theory that Darwin enumerates in his introduction? 4. What facts gleaned from his experiences on the Beagle seemed to "throw light" on the origin of species? 5. What aspects of domesticated animals and cultivated plants help to explain biological diversity? 6. How does the example of "plants which have suddenly produced a single bud with a new and sometimes widely different character" advance Darwin's argument? 7. What is the point of the long discourse on pigeons? What does it prove? 8. Why do domesticated species tend to vary more externally rather than internally?

Grammar study: *Woe is I*, chapter 5. "Verbal Abuse"

Tuesday, September 26

Read *The Portable Darwin*, pp. 136-159 and 194-215, Chapter two, and the "Recapitulation and Conclusion" of the *Origin of Species*.

Study questions: 1. How does the perfection or imperfection of nature relate to Darwin's overall hypothesis? 2. Describe the circularity of the argument that "important characters do not vary." 3. How does the existence of doubtful species advance Darwin's thesis? 4. How does Darwin suggest that intermediate varieties between species are lost? 5. What aspects of the recapitulation could be used to defend racist positions? 6. How is a nationalistic-militaristic point of view supportable using Darwin's ideas?

Questions for discussion: "What limit can be put to this power, acting during long ages and

rigidly scrutinizing the whole constitution, structure, and habits of each creature, -- favouring the good and rejecting the bad? I can see no limit to this power in slowly and beautifully adapting each form to the most complex relations of life." 1.. Has Darwin essentially made a natural process into an active deity? 2. Is this a prejudiced, anthropocentric view of nature? 3. What aspects of Darwin's writing might encourage: a) The conception that natural selection is a matter of violent, warlike interaction between members of a single species, b) An intensely critical attitude toward social structures that perpetuate privilege and social inequities?

Grammar study: *Woe is I*, chapter 6, "Comma Sutra"

## Darwin among the "Atoms of Life"

Thursday, September 28 What constitutes design?

Read Michael Behe's article "Molecular Design: Experimental Support for the Design Inference," on the web at [www.arn.org/docs/behe/mb\\_mm92496.htm](http://www.arn.org/docs/behe/mb_mm92496.htm)

and Jerry A. Coyne's review at [www.world-of-dawkins.com/box/nature.htm](http://www.world-of-dawkins.com/box/nature.htm)

Study questions: 1) Has Behe proved that so called irreducible complexity in nature is designed? 2) If Coyne believes that Behe's theory is "airtight," why does he still insist that it is wrong? 3) Critique the logic behind Behe's argument. 4) Is it impossible to falsify Behe's ideas, as Coyne claims? 5) Do you agree with Coyne that Behe's ideas are "bad religion" as well as "bad science?"

Today's convocation is presented by Patricia O'Conner '71, author of *Woe is I*

Tuesday, October 3

Read the first two chapters of *Climbing Mount Improbable*

Study questions: 1. What is the essential characteristic that Dawkins uses to distinguish between design and accident? 2. What criterion does Dawkins use to distinguish between "designoid" and designed? 3. What point does the example of the copulating millipedes make? 4. How is "designoid finding" different from "pure finding?" 5. Describe the limitations of simulating evolution on the computer as described by Dawkins.

Discussion: Is it possible to prove that any creature or person is conscious? Is it possible to disprove the contention that any structure was designed?

Thursday, October 5

Read chapters 3 and 4 of *Climbing Mount Improbable*.

1. What is the point that, according to Dawkins, Fred Hoyle misses? 2. How would Dawkins use the "Mount Improbable" metaphor to explain Behe's "irreducible complexity?" 3. Describe the terms of the debate between Kelvin and Darwin. 4. Explain this statement: "God should be seen by Fred Hoyle as the ultimate Boeing 747." 5. How is a junkyard as improbable as a 747? 6. In what ways is mutation non-random? 7. Why is beneficial mutation unlikely? 8. Why, according to Dawkins, are mutator genes likely to be ephemeral? 9. What point do dark urban moths illustrate regarding the chronological correlation between natural selection and mutation? 10. How does heredity differ from reproduction? 11. How does "pre-adaptation" help to explain thornier cases of evolutionary origin? 12. How does the television aerial analogy help to explain

the unlikelihood that large-scale mutations will be beneficial? 13. What is the difference between punctuated equilibrium and macro-evolution? 14. How does the process of defining species potentially lead to the apparent disappearance of intermediates? 15. According to Sewall Wright, under what circumstances does it become likely that selection will proceed "downhill," in a "period of relaxation?"

Tuesday, October 10

Paper 3 due: Argument for or against the existence of design in nature.

Thursday, October 12

Read Chapter four, "Life's First Appearance on Earth," from *Rare Earth*, by Peter D. Ward and Donald Brownlee.

### **Saturday, October 14 through Sunday, October 22: Fall Recess**

Tuesday, October 24

Read Chapters five and six, "How to Build Animals," and "Snowball Earth," from *Rare Earth*

Thursday, October 26

Read Chapters ten, twelve, and thirteen, "The Moon, Jupiter, and Life on Earth," "Assessing the Odds," and "Messengers from the Stars," from *Rare Earth*.

Tuesday, October 31

Read "The Storm Before the Calm," and "The Cosmic Context" from *Non-Zero*, by Robert Wright

Thursday, November 2

Read "Why Life is So Complex," and "The Last Adaptation," from *Non-Zero*, by Robert Wright

Assemble list of questions for next Tuesday's interview with Thomas Cech

Tuesday, November 7

9:00 a.m. Video conference with Thomas Cech '70 (Nobel laureate in Chemistry)

Thursday, November 9

Read "Non-Crazy Questions," and "You Call This a God," from *Non-Zero*, by Robert Wright

Tuesday, November 14

Summary and Conclusion of Darwin's *Descent of Man and Selection in Relation to Sex*

Thursday, November 16

Read "Evolutionary Ethics: A Phoenix Arisen," by M. Ruse

Tuesday, November 21

Read "Central Park," and "Darwin's Prodigy," from *The Mating Mind*, by Geoffrey Miller

Thursday, November 23

Read Chapters Six and Seven, "Courtship in the Pleistocene," and Bodies of Evidence," from *The Mating Mind*

Tuesday, November 28

Read Chapter Eight, "Arts of Seduction," and Chapter Eleven, "The Wit to Woo," from *The Mating Mind*

***Thursday, November 30 through Sunday, December 2: Thanksgiving Break***

Tuesday, December 5

Paper 4 due

Thursday, December 7

Friday, December 15

Revision of fourth paper due.