

NEH Workshop
“Bridging the Gap Between the Sciences and Humanities”
Year Two

Location: The University of Notre Dame
“Life: Origins, Purposiveness, and Transformations”
May 30, 2004-June 11, 2004

The Seminar Readings are arranged in two parts, below: Syllabus and Book List and Reader of Selected Materials.

SYLLABUS

Opening Reception: Sunday, May 30: Location

Day I: Monday, May 31

Morning: The Question of Origins

This session looks at some great questions about the origins of the living state. It opens the workshop with a set of questions that will be followed through the various sections.

Readings: Plato, *Timaeus*, esp. 39e-48e; 72e-92c (Kalkavage edition)

Genesis I, 1-11, NRSV.

Empedocles, *On Nature*, trans. Freeman (Reader)

Afternoon: What is Life? Classical Reflections

Readings: Aristotle, *Parts of Animals* I.v, 644b25-646a (McKeon pp. 656-58)

On the Soul, Book II, chps 1-4 412a1-416b30 (McKeon pp. pp. 554-64)

On Respiration 470b-475b10; 479b17-480b30. (Reader)

Galen, *On the Natural Faculties*, Selection from Book I, (Reader)

Evening Lecture: Peter Kalkavage on the *Timaeus*

Day 2: Tuesday, June 1: Are Organisms by Design or Chance? The Ancient Debate

Morning: Reflections on Chance and Design

Readings: Lucretius, *On the Nature of Things* Book I, Book V.

Galen, *On the Usefulness of the Parts*, trans. M.T. May, Book VI. (Reader)

Afternoon: The Heart

Readings: Galen, *On the Usefulness of the Parts* Book VI, (Reader)

Galen, *On the Natural Faculties* Selection from Book III (Reader)

Vesalius, Selection from *Epitome on Anatomy* trans. L.R. Lind (Reader)

Laboratory: Dissection of the Heart, Lung and Trachea according to Galen.

Day 3: Wednesday, June 2: “Life as a Mechanism”

Morning: Harvey on the Circulation of the Blood

Readings: Harvey, “On the Manner and Order of Acquiring Knowledge” (Reader)

Harvey *On the Motion of the Heart and the Blood*, trans. Willis. (Reader)

Film: *William Harvey and the Circulation of the Blood* (Wellcome Institute)

Afternoon:

Readings: Descartes, *Discourse on Method*, Part V, *The Philosophical Writings of Descartes Vol. I* (Cambridge UP) pp. 131-41.

Descartes, Selection from *Treatise on Man*. pp. 99-108 (Cambridge ed)

Lavoisier, Antoine “Experiments on Respiration (1777)” (Reader)

Lavoisier and Laplace, selection from “Memoir on Heat (1780) (Reader).

Evening: Begin showing of film series *The Voyage of Charles Darwin* (7 parts) Parts 1-2

Day 4: Thursday, June 3: Nature as a Work in Progress I: The Darwinian Revolution”

This session will be devoted to the issues of form, function and transformation. It will begin with readings and a laboratory on morphology and then move into the reading of the *Origin* in the afternoon.

Morning: “Form, Function and Transformism”

Readings: Selection from Aristotle, *Parts of Animals I*. chps i-iv (McKeon pp. 643-56.

Lamarck, selection from the *Zoological Philosophy* Part I (Reader)

Cuvier, Selection from “Lectures on Comparative Anatomy” (1800) and “Natural History of Fishes” (1828). (Reader)

Dissection Laboratory on the Squid and Fish

Afternoon: “Darwinian Transformism”

Reading: Darwin, *On the Origin of Species* 1st ed. (Harvard U Press 1964), chps. 1-4.

Evening: Darwin Film Series Parts 4-5-6

Day 5: Friday, June 4: “Darwinian Transformism”

Morning: Darwin’s *Origin II*

Readings: Darwin, *Origin of Species*, chps. 9, 13, 14

Darwin, *Origin of Species* 6th ed. chp. (Reader)

Afternoon: Teams meet to discuss integration of what they have read and discussed to this point.

Day 6 : Monday June 7: “Humanity in an Evolutionary Universe”

Morning: Readings: Darwin, *Descent of Man*, 2nd ed. (1874), chps. 3,4,6,8, General Conclusion. (Duplicated Selections in separate offprint)

Afternoon: Evolution and Literature: Contrasting Views”

Readings: Tennyson, "In Memoriam." (1858). (Norton Critical Edition)

Hardy, Poems "Hap" 1866, "Convergence on the Twain" and "In Tenebris" (Reader)

Day 7: Tuesday, June 8: The Question of Inheritance Morning: Classical Mendelism

Readings: Mendel, "Experiments on Plant Hybridization" (St. Johns College Edition)

DeVries, Hugo, "The Law of the Segregation of Hybrids" (1900) (Reader)

Afternoon: Difficulties in Mendelism and the Theory of Chromosomes

Readings: Morgan, T. H. "Sex-linked Inheritance in *Drosophila*" (1910) (Reader)

Sturtevant, "Linear Arrangement of Six Sex-Linked Factors in *Drosophila*" (Reader)

Laboratory on Fruitfly inheritance and Mendelian ratios.

Day 8: Wednesday, June 9: Mechanism, Reductionism and Purpose: The Contemporary Debate

The point of this final day of actual course work will be to return us to the issues of the first sessions and the "big questions" of form, function, and teleology.

Morning: Modern reductionism and the question of purpose:

Readings: Jacques Loeb, "The Mechanistic Conception of Life" (1912). (Reader).

W. Roux "Contributions to the Developmental Mechanics of the Embryo" (1885) (Reader)

H. Driesch, "The Potency of the First Two Cleavage Cells" (1891) (Reader)

Driesch, H. Selections from *The Science and Philosophy of the Organism* "introduction", "Elementary Morphogenesis," "Analytic Theory of Morphogenesis", "The Problem of Morphogenetic Localization" (Reader).

Afternoon: The Molecular Option:

Readings: Schrödinger, *What is Life?* (1945) (Cambridge U Press edition)

Dorothy Wrinch, "On the Molecular Structure of the Chromosomes" (1936) (Reader)

Evening: Full Length BBC Film *Life Story*. This dramatizes the work of Watson, Crick, and Rosalind Franklin. It raises methodological and scientific issues, and it also develops in a complex and nuanced way the contribution of men and women to this development.

Day 9: Thursday, June 10: The Double Helix and Beyond

Morning:

Readings: Watson and Crick, the short 1953 papers. (Reader)

Marjorie Grene, "Biology and the Problem of Levels of Reality" (Reader)

Kay, Lily "Life as Technology" (Reader)

Afternoon:

Group Meetings and Assessment

Day Nine evening: **Party & optional reading of selections of Jonathan Tolins "eugenics" play, *The Twilight of the Gods*.**

Day 10; Friday June 11: Presentations about Past and Future. End by 2:30 pm.

In accord with the wishes of many of last year's participants, you are encouraged to buy the books and to read ahead for the seminars. We will send to you by mid-March, at your institutional address, a copy of your Seminar Reader. As with all other readings, you must purchase the reader; in this case we would expect reimbursement for the reader at the seminar. The anticipated cost of the reader is approximately \$ 25.00, but that is a "guess-timate." We will notify you of the costs before coming to the seminar.

Book List

- Aristotle: *The Basic Works of Aristotle*, ed. R. McKeon (Random House; same edition purchased last year). ISBN 0-375-75799-6
- Descartes, *Philosophical Works of Descartes* trans. Cottingham (Cambridge U Press) Vol. 1 ISBN 0 52128807 X. (Same text as used last year).**
- Darwin, Charles. *On the Origin of Species* 1st edition (Cambridge: Harvard U Press, 1964, ISBN: 0-674-63752-6
- Darwin, Charles *Descent of Man* (selected) (Duplicated & Bound in Seminar Reader)
- Harvey, William. An Anatomical Disquisition on the Motion of the Heart and the Blood trans. R. Willis (Duplicated & Bound in Seminar Reader)**
- The Holy Bible, NRSV translation (or equivalent). Assume people have their own.**
- Lucretius, *On the Nature of Things*, trans. Frank Copley (New York: Norton, 1977 ISBN 0393064263.) Price: \$16.35**
- Mendel, Gregor, *Experiments with Plant Hybridization*. St. Johns College Press. \$ 5.25
Please order both Mendel and Plato, below, through the St. John's College Bookstore in Annapolis. S&H is \$5.00 for the first book, and additional \$1.00 for each additional book. Please contact: Christine Hardy, Assistant Manager, St. John's College Bookstore, POB 2800, Annapolis, Maryland 21404-2800; (410) 626-2540 (Phone); (410) 295-5550 (Fax); c-hardy@sjca.edu
- Plato, *Timaeus* trans. Kalkavage (same edition we used last year), \$ 10.95**
- Schrödinger, Erwin, *What is Life?* ed. R. Penrose. Cambridge, CUP, 1992, ISBN 0521427088
- Tennyson, Alfred. "In Memoriam," Erik Gray, Ed. 2nd ed. (NY: Norton Critical Edition, 2003) ISBN: 0-393-97926-1

Reader of Selected Materials: Contents

- Cuvier, Georges, Selections from “Lectures on Comparative Anatomy” (1800) and *Histoire naturelle des poissons* (1828) (11 pp)
- Darwin, *Origin of Species* “Historical Sketch” (added in 3rd edition) (8 pp)
- Darwin, *Origin of Species* chp. iv from 6th edition (37 pp)
- DeVries, H. “The Law of Segregation of Hybrids.” (1900) (6 pp)
- Driesch, H. Selection from *The Science and Philosophy of the Organism* (1925) (ca. 25 pp)
- Driesch,, H. “The Potency of the First Two Cleavage Cells” (1891) (10 pp)
- Empedocles, *On Nature* (fragments) Freeman edition (5 pp)
- Galen, *On The Usefulness of the Parts of the Human Body*, Vol I, Book VI. Cornell U Press. (ca. 40 pp)
- Galen, *On the Natural Faculties* Selections from Books I, III (10 pp)
- Grene, M. “Biology and the Problem of Levels of Reality” (1967) (20 pp)
- Hardy, Thomas, Selected Poems (5 pp)
- Kay, L. “Life as Technology” (14 pp)
- Lamarck, J. B. Selection from *Zoological Philosophy*, trans. H. Elliot (25 pp)
- Lavoiser, Antoine and Pierre Simon LaPlace, Selection from *Memoir on Heat* (10 pp)
- Lavoisier, Antoine “Experiments on Respiration” (1777) (10 pp)
- Loeb, Jacques, “The Mechanistic Conception of Life” (1912) (20 pp)
- Morgan, Thomas H. “Sex-Linked Inheritance in *Drosophila* “ (1910) (5 pp)
- P. R. Sloan, Commentary on *Origin of Species* (optional) (30 pp)
- Roux, W. “Contributions to the Developmental Mechanics of the Embryo” (1885) (10 pp)
- Sturtevant, “Linear Arrangement of Six Sex-Linked Factors in *Drosophila*” (1913) (5 pp)
- Vesalius, Andreas, Selection from the *Epitome of Anatomy* (1543), trans. L.R. Lind (2 pp)
- Watson and Crick, “A Proposed Structure for DNA” and “Genetical Implications of the Structure of DNA” (6 pp)
- Wrinch, Dorothy, “On the Molecular Structure of the Chromosomes” (1936)(18 pp)