

NS 300 **Early Life and The Growth of Scientific Thought**  
London, 2007

Using London as a backdrop, students will explore scientific concepts about early life on Earth as they are introduced to the growth of empirical natural philosophy, a unique product of the English Enlightenment. Morning lectures will focus on two themes: the biochemical basis of life and the empirical basis of science. Afternoon field trips will introduce students to London's phenomenal natural history collections, which catalyzed scientific thought from the Enlightenment through contemporary times.

3 weekly quizzes: 60%  
2 field trip exercises: 20%  
Final exam: 20%

Textbook: Busher & Hammer, *Laboratory Manual for the Biological Sciences*

Schedule:

Morning lectures  
Field trips (as arranged)

Introduction to the Course: Science as Philosophy, Why London?

ASSIGNMENTS AND GRADING PROTOCOL

**Field Trip: Down House. (Morning Departure: Bring your bag lunch to lecture, we'll leave straight from Harrington Road).**

We will take an in-depth look at Darwin's life, his contributions, and his place within 19th century science and society. Please bring cameras, etc. and be prepared to take notes. You will be asked to incorporate information gathered on this trip in your final exam question.

Water and Biological Systems

Molecular Evolution and the Origin of Life

**(Homework assignment related to final exam)**

**Field Trip: Natural History Museum Origin of Life Exhibit**

This field trip will tie what you have learned about time and London to a new look at the origin of life. The exhibit provides a close look at biological history as it occurred right here in London.

Practice Quiz and Introduction to Lipids  
Biological Membranes

**Field Trip: British Library**

This field trip will introduce you to a profound collection of historical texts that are housed in the British Library. You will focus on two questions: 1) How is water depicted in the texts you examine and 2) How do these texts reflect the development of scientific thought through the centuries?

**QUIZ**

Introduction to Proteins  
More cool stuff about Proteins

**FIRST GROUP PROJECT DUE**

Trip to Oxford. **Departure TBA.**

A central idea of this course is to see science as a historical phenomenon that is closely linked with developments in society. You will continue this line of inquiry at Oxford. Please bring cameras, etc. You will be asked to document your explorations in Oxford to elucidate questions about science as a part of history and society.

Protein Review

Replication Molecules: Key to Evolution

**Field Trip: British Museum**

Early scientific inquiry was based on natural history collections, and the world's premier collections are housed in the British Museum. This field trip will acquaint you with the seminal work of Sir Hans Sloane, the founder of the British Museum, whose work pre-dated Darwin by more than a century. During our tour of the Enlightenment Room, you will be introduced to the birth of modern science during the 18th century, during which London was the center of the intellectual world. Bring cameras and be prepared for some surprises!

Carbohydrates in Biological Systems

Molecules in a Functional Perspective

**Field Trip: Chelsea Physic Garden**

We will continue our exploration of historical collections (and Hans Sloane's inimitable contributions to our intellectual heritage) in this living museum of plants. As we consider what we have studied so far in this course, think about the scientific understanding reflected in the "physic" (healing) properties of the plants at Chelsea.

## QUIZ

Introduction to Metabolism  
ATP Cycle and Glycolysis

## SECOND GROUP PROJECT DUE

Introduction to Photosynthesis  
Photosynthesis in an Evolutionary Perspective

### Field Trip: Kew Gardens

The Royal Botanic Gardens at Kew are a UNESCO world heritage site. Kew is the world's foremost botanical garden and research center. We will examine parts of this enormous garden with a focus on plants and their co-evolution with humans.

Introduction to Aerobic Metabolism  
Mitochondria, Metabolism, and Endosymbiosis

### Field Trip: Parliament

Early scientific progress in the United Kingdom was part of an open society where the rule of law and intellectual freedom went hand in hand. A representative, elected government, embodied in the British Parliament, allowed and enforced this progressive society. During our visit to Parliament today, consider that this building is much more than a tourist site. Indeed, it represents the cornerstone of scientific and societal progress in the Western World.

## QUIZ

Student Presentations  
Student Presentations

## Final Exam