

# History of Life Sciences in the Twentieth Century

HISC 108  
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Unless you are a freakish intellectual prodigy, you and I were born in the twentieth century, which has been called 'the century of the gene'. We will be thinking more about the origins of the word 'gene' but broadly speaking it comes from the Greek word 'genesis' meaning 'origin', 'creation', 'generation'. In other words, we were born during a time in which the very phenomenon of coming into existence as a living organism became the focus of intensive scientific investigation. This class explores the history of scientific exploration of the mysteries of organismal generation, from its origins in the agricultural sciences of the second half of the nineteenth century to the science of human evolution of the twenty first century. As you can see from this summary, 'twentieth century' is loosely interpreted!

In some respects, however, century of the Gene did begin right on time, in the year 1900, when three more or less unconnected scientists in different parts of Europe all got their hands on Mendel's hitherto obscure work, first published in 1866, and realized that it was the key to a new understanding of heredity. In May 1900, William Bateson, the Cambridge professor of zoology who would invent most of the words we now use to express genetic concepts, was due to give a lecture at the Royal Horticultural Society about one of these three scientists. He brought with him a copy of Mendel's 1866 paper to read on the train to London. By the time he got off the train at Liverpool Street Station he was a convert. His wife said later that it was as though 'with a very long line to hoe, one suddenly finds a great part of it already done by someone else.' (Henig, p.2) When he got to the lecture hall he had changed the subject of his presentation to a talk all about Mendel. This is how he began the lecture:

*An exact determination of the laws of heredity will probably work more changes in man's outlook on the world, and his power over nature, than any other advance in natural knowledge that can be foreseen. (Bateson, p.1)*

This class tells the story of the quest to understand the laws of heredity, and to gain power over nature. At every step it also charts the way that the sciences of life changed humankind's 'outlook on the world'. The greatest political calamities of the twentieth century, as well as the most profound advances in human wellbeing, are bound up with advances in the life sciences. The story of the life sciences in the twentieth century shows the extent to which our understanding of nature is always and inseparably entangled with views about ourselves and about the social and political order.

### **Class Requirements**

There will be two midterms, which will be take-home essay questions to be answered in 6 to 8 double-spaced pages. Each of these is worth 40% of the grade. On Thursday of ninth week, we will be discussing the ethics of twenty-first century 'racial science', and you will need to come to class having done the reading and prepared to talk about it, for an additional 5%. The last assignment is for you to find an article in the news about some aspect of the environmental sciences, and to write just one paragraph about its significance for the coming century. This nice, easy assignment is worth 15% of your grade. The readings will be on TED, in electronic form, in 'Content', sorted into folders marked for the week of the quarter, and you should keep up with them as it will make your life much easier when it comes to the writing.

## Outline of lectures and assignment due dates

- 1. Mendel and the question of hybrids**
  - 1/8 Introduction
  - 1/10 The monk in the garden
- 2. Century of the Gene**
  - 1/15 1900
  - 1/17 Enter the fruit fly
- 3. Darwin, Galton and the breeding of better humans**
  - 1/22 Darwin
  - 1/24 Galton and Eugenics
- 4. Synthesis and reform**
  - 1/29 Unity and disunity in science and politics
  - 1/31 Dobzhansky and *Dr. pseudooscura*
- 5. Eugenics in the Atomic Age**
  - 2/5 Hiroshima and the Genetic Effects of Nuclear War
  - 2/7 Man and his Future
- 6. Cracking the code**
  - 2/12 The atoms of biology (Tuesday of sixth week, Midterm 1 due, 40%)
  - 2/14 The genetic code
- 7. The great mysteries of mind**
  - 2/19 Eric Kandel and the sea slug
  - 2/21 reducing the mystery of memory and the future of scientific humanism
- 8. Questions of development**
  - 2/26 Fruit flies and feminists
  - 2/28 Food, love and epigenetics
- 9. Racial science revisited.**
  - 3/5 The Genographic Project (Tuesday of ninth week, Midterm 2 due, 40%)
  - 3/7 Scientific ethics for a new millennium (Discussion of Genographic Project ethics statement: 5%)
- 10. Eco-evo-devo-bio-psycho-social...?**
  - 3/12 The Anthropocene
  - 3/14 What lies ahead (Anthropocene research project: 15%)