

Darwin didn't discover evolution; there were many other scientists before him who had argued that species were not immutable. In this set of readings, you will explore the ideas of three scientists: Lamarck, Wallace, and Darwin.

1. Jean Lamarck's "Zoological Philosophy."

What is the role of the environment in Lamarck's explanation?

Lamarck says, "Nothing of all this can be considered as hypothesis or private opinion; on the contrary, they are truths which, in order to be made clear, only require attention and the observation of facts." Was Lamarck's explanation scientific? Why or why not?

Can you propose any other explanations for Lamarck's observations about the disuse and use of organs?

2. Thomas Malthus's "An Essay on the Principle of Population"

What fact does Malthus discuss about the potential growth rate of populations and the tendency of organisms to try to maximize the number of offspring?

What fact does Malthus discuss about the growth rate of subsistence, that is, of resources to support growth? What are some of the resources of subsistence?

3. Alfred Russel Wallace's "On the Tendency of Varieties to Depart Indefinitely from the Original Type."

How would you characterize Wallace's idea, "The life of wild animals is a struggle for existence?" How is Wallace's view scientific?

Wallace claims that "useful variations will tend to increase, unuseful or hurtful variations to diminish." How does this occur? What evidence does he cite?

How does Wallace's explanation differ from Lamarck's?

What do you think of Wallace's critique of Lamarck's hypotheses?

4A. Excerpts from Charles Darwin's *On the Origin of Species*.

According to Darwin, is variation among individuals commonplace or rare within a population?

According to Darwin, why are individual differences important for the operation of natural selection?

What is the "struggle for existence" to which Darwin refers?

What role does the struggle for existence play in natural selection?

Why is it necessary that variations be heritable in order for natural selection to operate?

Briefly explain the process of natural selection and how it changes populations across time.

4B. Excerpts from Charles Darwin's *On the Origin of Species*.

Why do you think Darwin was surprised when he read Wallace's ideas?

What led Darwin to formulate his ideas about the origin of species?

On what did he base his explanations?

What did Darwin propose as the origin of species?

Was Darwin's explanation scientific? Why or why not?

How did Darwin attempt to determine how modifications of a species are accomplished?

How did Darwin explain the incomplete nature of his ideas?