

清华大学 Tsinghua University
00692212-90 达尔文革命 (全英授课) Darwin's Revolution
期末考试 Final exam
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Please submit your answers to the web portal (网络学堂) within the designated deadline. If you miss the deadline, your answers will NOT be graded. There are 8 questions below. Choose **5** out of these 8 questions to answer. Each answer accounts for 20%. The total mark is 100%.

1. The eminent historian of science Thomas Kuhn took the Darwinian Revolution as “revolution-making” as the Copernican Revolution in changing people’s worldviews. Explain what Kuhn meant by comparing Darwinian with Copernican Revolutions in terms of similarities and dissimilarities. Draw from our lecture ppt and required texts, explain what “Darwinian Revolution” encompassed. What was revolutionary about the Darwinian Revolution? Was there a Darwinian Revolution? If so, when was it and what kind of revolution was it?
2. Pre-Darwinian evolutionists such as Robert Chambers’s 1844 *Vestiges of the Natural History of Creation* shaped the scientific and popular reception of the *Origin of Species* in 1859. Explain how the secret authorship and public reaction to Chambers’s *Vestiges* paved the way for the subsequent publication and reception of Darwin’s *Origin*. Draw from our lecture ppt and required texts, explain why it was important to look at the pre-Darwinian and post-Darwinian history of evolutionary ideas in order to contextualize Darwin and his work in his time and place.
3. Geology was integral to biological evolution. Without geology, there would be no evolutionism. Draw from lecture ppt and required texts, discuss how geologists used geological evidence to challenge biblical creationism and how the history of earth relates to the history of life. Explain how Charles Lyell’s uniformitarianism influenced Darwin’s theorizing of the formation of coral reefs and geological structure of the coast of Cape Verde Islands.
4. In our textbook titled *The Darwinian Revolution* (1st edition), Michael Ruse advocated a synthetic analysis of the Darwinian Revolution. While suggesting the scientific aspect of Darwin’s theory was important, Ruse wrote, “But there was a great deal more to the Darwinian Revolution than just this narrow science.” (Ruse 1979, p. xiii). What was the “narrow science” that Ruse was referring to? Give at least 2 supra-scientific or non-scientific factors and discuss how these factors are intertwined in the Darwinian Revolution. What does Ruse mean by saying “Many elements are involved in the Darwinian Revolution—some, of course more important than others.” (Ruse 1979, p. xiv)?
5. In our textbook titled *The Non-Darwinian Revolution: Reinterpreting a Historical Myth*, Peter Bowler maintained that “the emergence of developmental evolutionism *did* constitute a revolution, although of a far less radical kind than the one portrayed in orthodox accounts.” (Bowler 1988, p. ix). What was the orthodox portrayal of the Darwinian Revolution? Why was it radical? How was the non-Darwinian revolution presented by Bowler less radical (and thus less revolutionary) than the orthodox account of the Darwinian Revolution?

6. In *The Non-Darwinian Revolution*, Bowler wrote “In a world without Darwin, Spencer would no doubt have written his *Principles of Biology* as an integral part of his overall philosophy...In other words, Spencer would certainly have tried to get the scientists interested in his views on biological evolution in the course of the 1860s. Perhaps he would eventually have succeeded, but it is difficult to see *Principles of Biology* as the basis for a "Spencerian Revolution" within the science.” (Bowler 1988, p.65). Discuss Spencer’s theory of progressive evolutionism in *Principles of Biology*. Then explain why Bowler did not think it was possible to sustain a “Spencerian Revolution” after the 1860s. Do you agree with Bowler’s assessment? Why or why not?

7. In Charles Darwin’s *Origin of Species*, he tackled the question of species by arguing “No one definition has satisfied all naturalists; yet every naturalist knows vaguely what he means when he speaks of a species. Generally the term includes the unknown element of a distinct act of creation.” (Darwin 2009[1876], p. 33) Why did the term “species” already implied an act of God’s creation in Darwin’s time? What are some of the various definitions given by the pre-Darwinian naturalists in discussing “species”? Why were debates about the conception and origin of species so central to the theory of evolution?

8. Below is a figure comparing Darwinian and Chambers’ modes of evolution (extracted from Bowler’s *Evolution: History of an Idea*). Drawing from our textbooks and lecture ppts, explain the major differences between Darwin’s and Chambers’s proposed systems of evolution in terms of the concept of species, mechanism of adaptation, parallelism between embryos and fossils, and progression from simple to complex level.

