

Teaching Writing
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Very rough draft of assignment sequence

1. Questions for class discussion (30 min. discussion, then 20 min. writing at end of class): How can we know what happened in the past? How do we know that George Washington was the first president of the U.S.? Why do we trust written records? (Because independent accounts agree? Because they help to explain other records and observations?) Is knowledge of **the** past different from other kinds of knowledge? How do we know that the planets orbit the sun? Does this inference depend on knowledge of the past?
2. Questions on Darwin's Origin of Species.
Did Darwin have any direct evidence that natural selection occurs? (answer: no.) How does Darwin convey the idea that natural selection is plausible, even inevitable? What is the logical structure of his argument? (What are the premises, what is the conclusion?) How does he support the premises? (10 mins of class discussion, then 15 mins of writing.)
How does Darwin use the evidence of a) the fossil record and b) geographical distribution to support his contention that evolution has occurred. (10 mins of class discussion, then 15 mins of writing.)
3. Inferences about the past, continued. Systematics.
How do systematists reconstruct the history of a group of organisms? What evidence do they use? (Characters. What are characters?) What methods do they use? (Cladists construct a parsimony tree, which minimises the number of character-state transformations.) Why do they think the methods yield an accurate history? (Parsimony and its critics. Popper's philosophy. What is science? What is truth? [Seek the truth? By all means. Find the truth? Forget it.])
4. Revising Darwin's theory of heredity. Integrating Mendelian Genetics with Darwinism: neo-Darwinism. How does it differ from paleo-Darwinism? What happens when we integrate modern molecular genetics with Darwinism? How does the theory cope with selfish DNA, junk DNA, and neutral molecular evolution? [possible texts: population genetics texts, Provine 1971, Kimura 1981]
5. Revising Darwin's paleontology. What if explosive radiations and mass extinctions are real, and not gaps in the fossil record as Darwin thought? How does this change our view of evolution? [possible text: Eldredge and Gould's punctuated equilibrium paper, or follow-up papers.]
6. Revising Darwin's biogeography. Re-interpreting chapters XI and XII of the Origin in light of plate tectonics. Vicariance biogeography and the integration of phylogenetics with regional histories. Bogus? Trivial? Revolutionary?

7. Topic: the origin of species. Does Darwin tackle this supposedly central question, or does he dance around it? What have we learned about speciation since Darwin's day? What are the outstanding problems relating to speciation today?

8. Inference about the past continued again. Grant proposal to tackle outstanding problem in evolution.