

Life Chapter 21: The History of Life -- Questions and Comments
Conservation Biology
Spring 2009

The purpose of reading this chapter is to give you some perspective on the history of life on our planet – especially with regard to major extinction events and the diversification of life. This should increase your understanding of evolution and of the rate at which new species can be formed.

1. It is worth noting the author's comments at the start of the chapter about how humankind's perceptions of time and the age of the earth have changed since the Renaissance. Of course, many continue to believe that the earth is no older than a few thousand years.
2. Please note this relationship: younger rocks are generally higher up in geological formations. This gave rise to the classification of life as "higher" and "lower". The original meaning of these two adjectives relates to where species first appear in the fossil record – "higher" is a synonym for "recent" and "lower" for more "ancient". They are not taken to mean "better than" or "not so good".
3. Also note that from the reading about dating that people are very careful and creative in finding accurate methods to work out dates. Considerable effort has gone into cross-checking dates. Note also that dates for rock formations are always hypotheses and subject to revision as methods improve. You need not learn any of the methods that are commonly used.
4. The "oxygen revolution" (term not used in your text) is probably one of the two or three most significant events that have occurred after the earth's initial formation. Please know the general outline of the when O₂ started to increase the specific cause (plants is not good enough) why and what the major effects of the increase in O₂ were on the evolution of life.
5. Note also that sea levels have changed repeatedly; these are very significant events and are often associated with extinctions.
6. Please understand why the fossil record is biased. What general type of rock (igneous, sedimentary or metamorphic) exclusively contains fossils?
7. Note the movement and changes in continents. The appearance of large continents in particular is often correlated with extreme weather conditions
8. During what geological period did most of the modern phyla of animals arise?
9. Understand what happened at the end of the Permian.
10. When did flowers arise?
11. What does it mean that the biota became **provincialized**?
12. When did the three major faunas appear? Be able to briefly characterize each.
13. What factors determine evolutionary rate (know several important factors beyond what we learned earlier in the course)? Is it always the same and is it the same in all groups?
14. In stable times, there tends to be evolution to larger size but on the other hand, large animals tend to be first species lost during times of environmental change. Give several reasons for these trends.

Terms: provincialized