

The Beak of the Finch: Chapters 10-13

Answer each question in at least one paragraph (ca. 150-200 words). Refer to the syllabus (section “Written assignments”) for formatting instructions.

1. How did Darwin envision speciation occurring in the Galapagos? What role does adaptive radiation play in this context? What did he call his hypothesis (principle) on how speciation occurs and what is the main problem with this hypothesis?
2. What is an adaptive landscape/adaptive peak? What data did Dolph Schluter gather to show the adaptive landscape for Darwin’s finches? What does the adaptive landscape for finches look like and why does it look like that? How is this landscape of importance when it comes to speciation and explaining the species assembly currently found on each island in the Galapagos?
3. Jonathan Weiner mentions two kinds of shorelines on the islands, the visible and the invisible. What does he mean by that? Expand on the invisible shorelines. How does a finch mainly identify a conspecific (a finch of the same species)?
4. Species are like islands. Aside from the main barrier that holds the finch species apart (Question 3), what else is important and what experiments did Peter Grant and Laurene Radcliffe perform to figure this out? Do sexual preferences typically stay constant over time? If not, why?
5. There are three examples of recent divergence and subsequent speciation/adaptive radiation (i.e. evolution in action) mentioned in Chapter 12 (*Drosophila paulistorum* complex, crossbills, sticklebacks). Choose one example that you find the most intriguing and explain it in greater detail including experiments that were performed. (Consider the word limit as a reference for the level of detail expected.)
6. Why haven’t the cactus finches changed over the course of the finch study? Why have *fortis* been able to change? Put this into the context of the adaptive landscapes of these two species.
7. What feature does hybridization add to a population and why is this important in terms of evolution? Explain this with the help of the example on fruit flies in Australia used in the book (*Dacus tryoni* & *D. neohumeralis*).