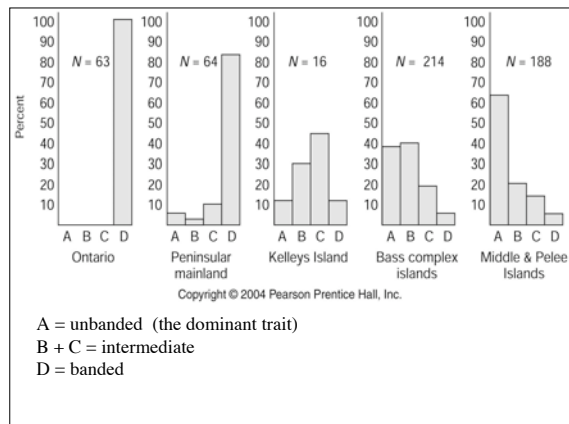
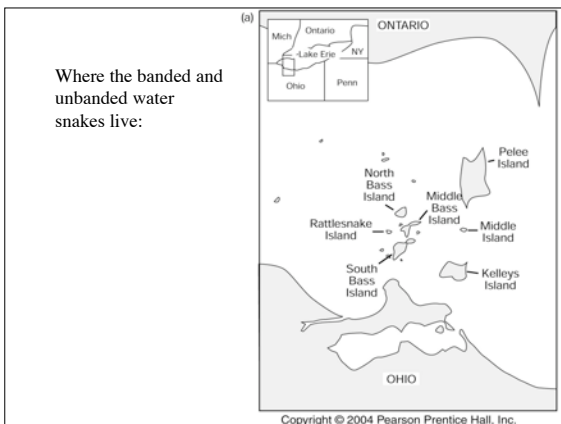
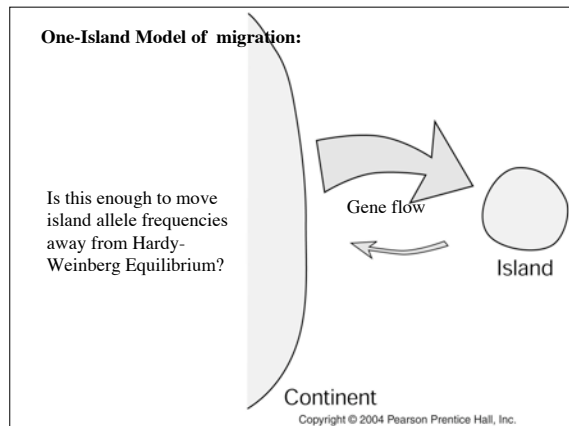
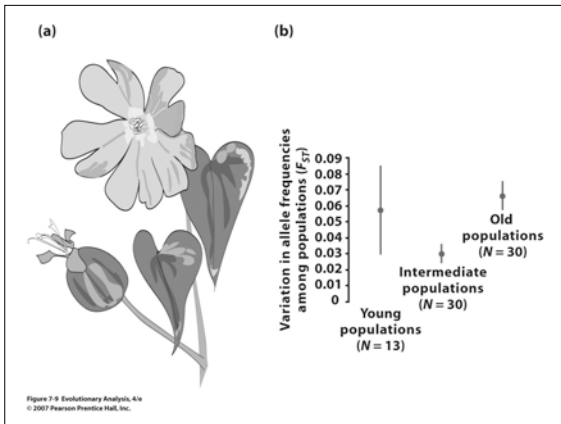


Migration

- Migration in evolutionary biology is gene flow: transfer of alleles from one population to another
 - Happens by occasional long-distance dispersal of juveniles, transportation of pollen, seeds, or spores by wind, water, or animals
 - Varies by species depending on mobility throughout their life-cycle.



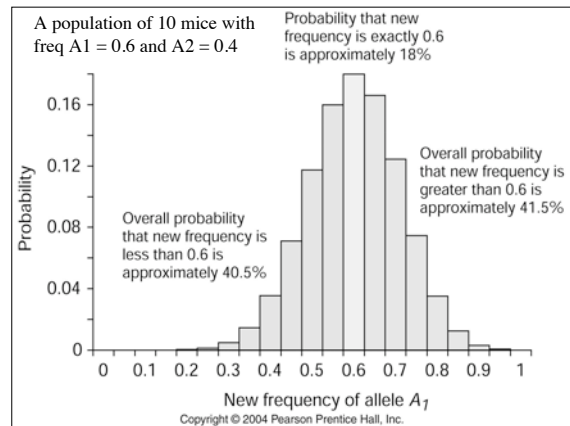


Effects of Migration

1. Within a single population migration can cause allele freq to change from one generation to the next
2. For small populations receiving immigrants from large, migration can be a potent mechanism for evolution
3. Across groups of populations, migration tends to homogenize allele frequencies

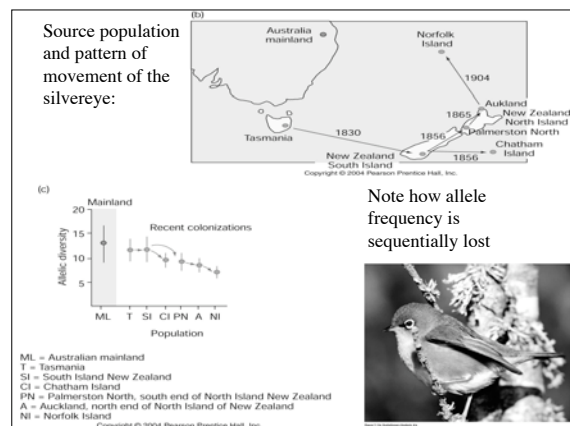
Genetic Drift

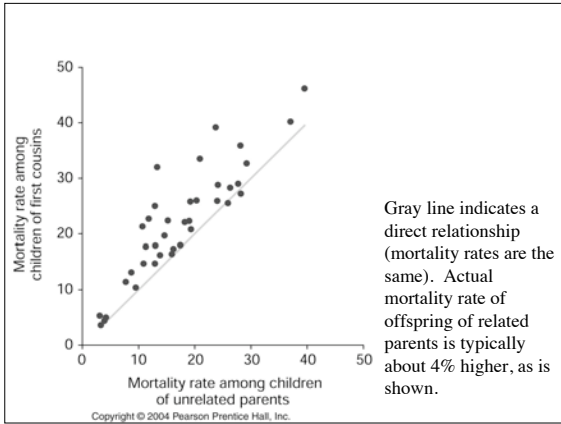
- This is a non-selective mechanism of evolution (evolution does occur by means other than natural selection!)
- It's essentially a sampling error as a result of violating the H-W assumption of infinite population size
- In a very small population.....



Ex: the founder effect

- A newly isolated or moved subset of a larger population will likely, by chance, have different allele frequencies than the source population
- Example of the silvereye native to Australia.....



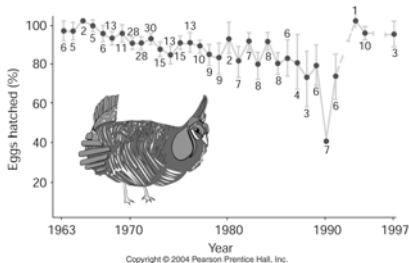


Back to the prairie chicken...

Prairie destruction fragmented and reduced the population size. Small isolated populations are where genetic drift is most powerful, resulting in random fixation and declining heterozygosity. With the resultant reduction in fitness due to that and inbreeding, progressively fewer chickens are surviving even though there is space for them....and **extinction vortex**

Test 1: evidence of inbreeding depression

- Compare hatching rates in the 1930's with now



Test 2: genetic diversity should be lower

- The present day Illinois birds had 3.67 alleles per locus compared to 5.33 to 5.83 in other populations

So the final test is what fixes the problem

- If you start introducing chickens from other populations you should reduce inbreeding and increase diversity and hatching rates should go up if these things were indeed the problem.....

They did, hatching rates shot up, so it looks like it was an extinction vortex.

Neutral Theory of Evolution

- Advantageous mutations are really rare and most alleles of most genes are selectively neutral so for most populations:

rate of evolution = rate of neutral mutation

- Therefore, the population size doesn't matter and natural selection doesn't matter
- Data are still coming in---at least serves as a null hypothesis (like H-W): if evolution rate is faster than mutation rate, some sort of selection is occurring