SEGMENT TWO, LECTURE SIX: VARIATION IN POPULATIONS

Phenotypes are either determined by:

1) Discrete characters, which are determined by alleles at one locus.
2) Quantitative characters, which are determined by alleles at two or more loci.

Morphs are “forms” (different phenotypes) of characters

Polymorphic populations have individuals with at least two morphs.

Variation can be measured as **average heterozygosity**, or the average percent of genes in the entire genome that are heterozygous. Variation in fruit flies has been measured at14% average heterozygosity, or 1,800 heterozygous loci out of a total genome of 13,000.

Genetic Drift - Deviations from an expected result due to limited population size.

- Chance events in small populations cause unpredictable changes in allele frequencies (Fig. 23.8);

- Bottleneck effects can occur when there is a severe drop in the size of a population (Fig. 23.9); Cheetahs have gone through at least two bottleneck events. Skin grafts are tolerated between any two cheetahs with virtually no rejection. Drift and bottlenecks can both occur as in the greater prairie chicken in Illinois (Fig. 23.10). Events that reduce genetic variation can leave a population at risk of extinction. How much variation is enough to conserve a species?

- Founder effect (or isolation bottleneck); A few individuals colonize a new area; Islands, such as the Galápagos, are places where founding events have been observed, such as the Galápagos/ finches.

Gene Flow occurs because of the movement of fertile individuals or their gametes (such as pollen) from one population to another (Fig. 23.12).