MICROEVOLUTION
AND POPULATION GENETICS
WHY STUDY THE GENES OF POPULATIONS?

• populations contain more genetic diversity than individuals
• to measure changes in allele and genotype frequencies over time
• to determine whether evolution is occurring
MICREVOlUtionary Forces
change allele & genotype frequencies in a population

1. Mutation:

   ![Diagram of beetle genetics](image)
   
   Mutated gene results in brown coloration

2. Natural Selection:

   ![Diagram of beetle predation](image)
   
   Predator eats the more easily seen beetles lacking the brown gene... resulting in an increase in brown gene frequency.
3. Gene Flow (e.g. migration):

4. Genetic Drift (random events)
Example of Genetic Drift among the Amish

- **Founder effect**: the genetic make-up of a small group doesn’t match the variation of the parent population.

The frequency of the allele for Van Crevald Syndrome is very rare among populations around the world, but high among the Amish.
Albinism Among the Hopi Indians

- The frequency of albinism in the U.S. is only about 1 in 20,000; but among the Hopi it’s about 1 in 200!

- **Hypothesis:** individuals with albinism were “reproductively favored” and passed on the recessive allele in greater frequencies due to **cultural selection** (similar to natural selection)!