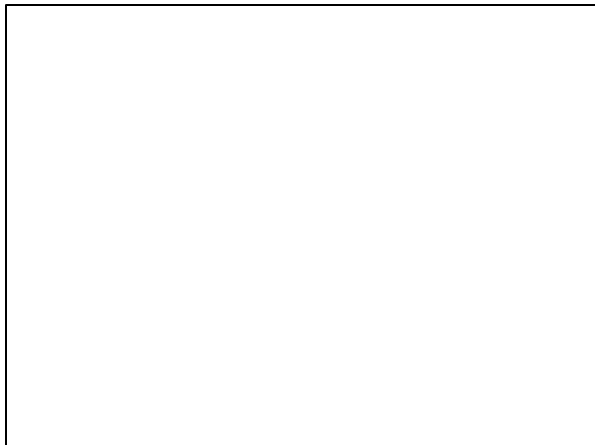


How do Adaptations Arise?

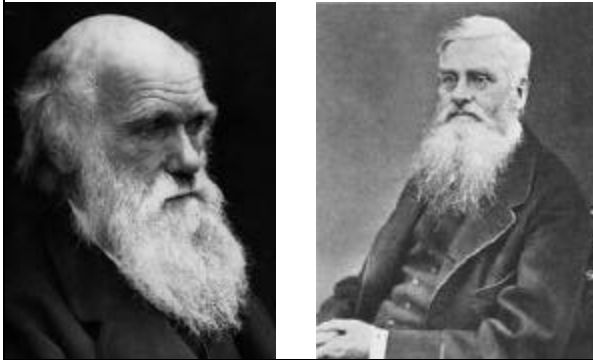
Darwin's Four Postulates



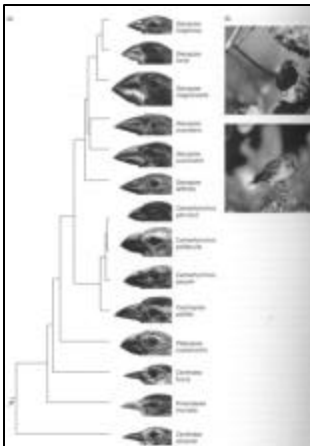
Natural Selection

Natural selection is the process that produces descent with modification. These modifications increase fitness (survivorship and/or reproduction)

Natural Selection



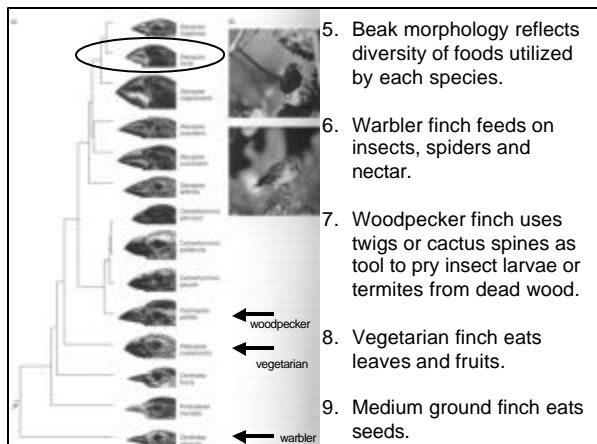


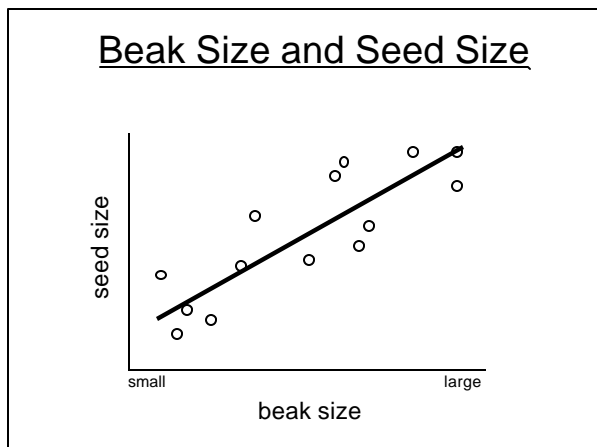


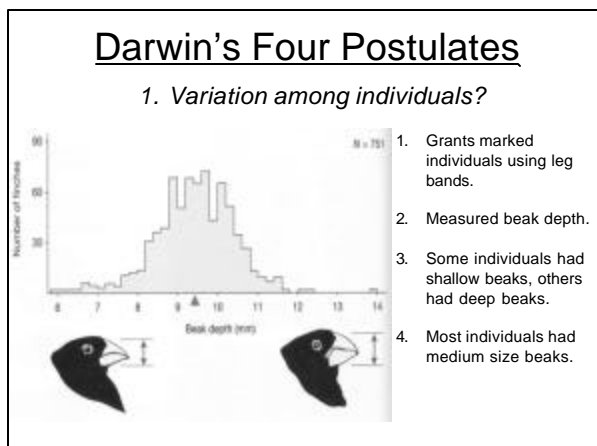
Natural Selection

Evolution of beak shape in Galápagos Finches
(Drs. Peter and Rosemary Grant)

1. 14 species found on islands.
2. Similar in colour and size: 4-6" in length; brown – black.
3. Beak size and shape differ substantially.
4. Beak used as a tool for feeding.

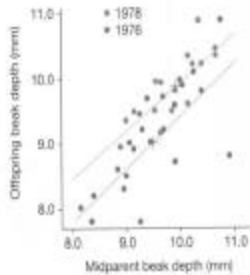






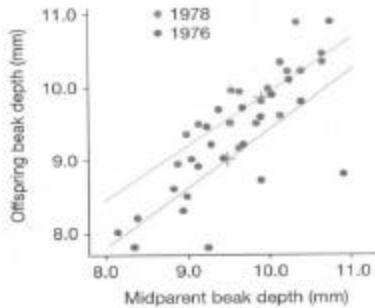
Darwin's Four Postulates

2. Is beak variation heritable?

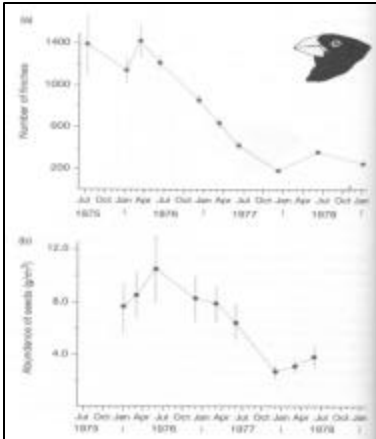


1. Dr. Peter Boag measured beak size of parents and offspring once they reached maturity.
2. Correlated midparent beak depth with offspring beak depth using a linear regression.
3. Discovered that much of the variation in offspring beak depth was explained by parent beak depth.

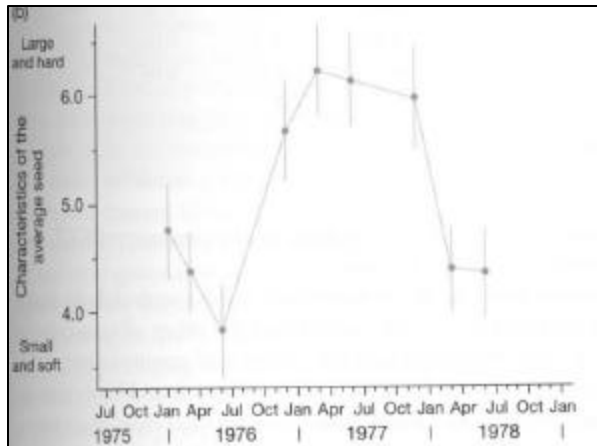
2. Is beak variation heritable?

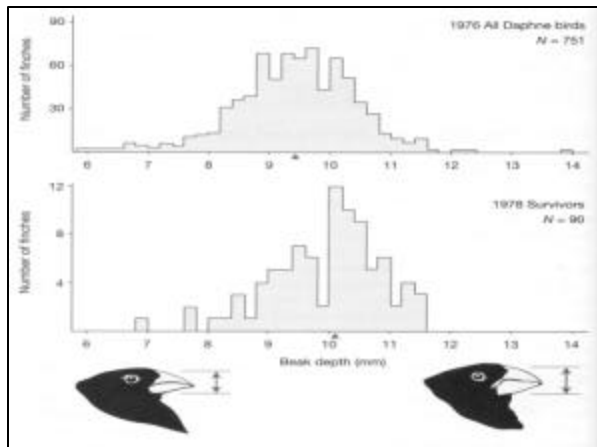


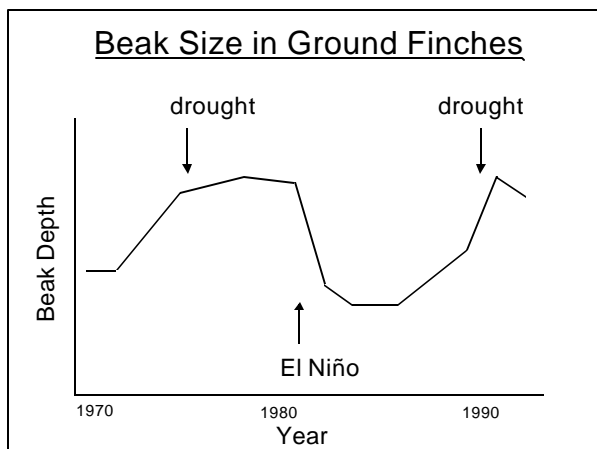
What are some of the concerns with measuring heritability this way?



1. In 1977 there was a drought and a large die off of ground finches (~80%).
2. Die off corresponded with a large reduction in seed availability.
3. Many dead birds were found emaciated.
4. In general, many more individuals are born then survive to reproduce.







Units of Natural Selection

1. Genes
2. Individuals
3. Groups
 - a few individuals
 - populations
 - species

