SELECTION

A) Introduction
1) acts on phenotype
2) artificial vs. natural

B) Types of Selection
1) Selection pressures
a) directional
b) disruptive
c) stabilizing
2) Sexual selection

SELECTION

Acts on phenotype

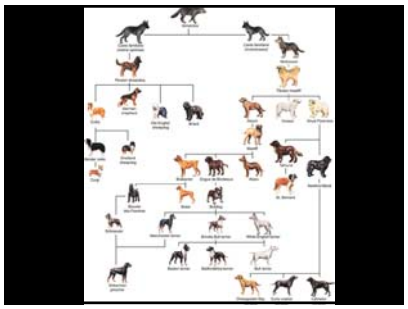
Genotype—genes/genetic material

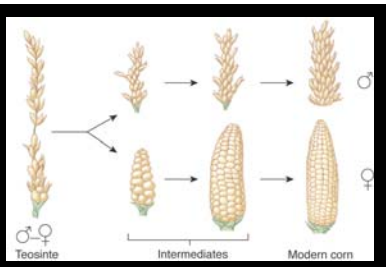
Phenotype—rest of the organism;
anatomy, behavior, etc which are products of the genes (and environment).

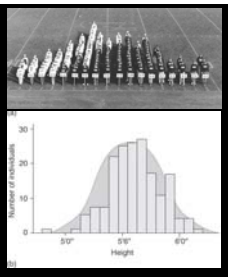
SELECTION

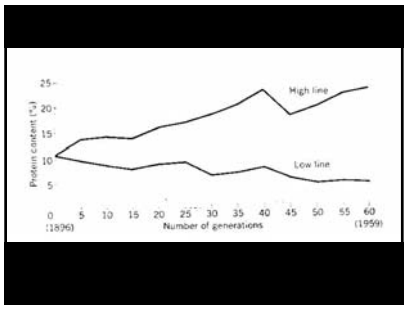
A) Introduction (cont.)
1) acts on phenotype
2) artificial vs. natural

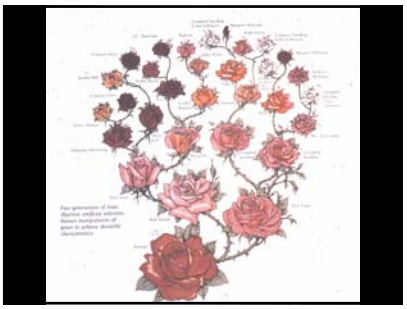
artificial – features preserved that suit human purposes.

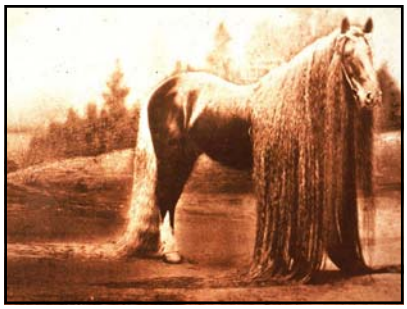












Natural Selection

1) Weeding out done by natural processes
2) average effect

Peppered Moth

Light and Dark Phases--Kettlewell

Significance

1) see changes
2) understand
3) adaptive basis

	Brown	Pink	Green
Beech-woodland	Common	Common	Rare

	Brown	Pink	Green
Beech-woodland	Common	Common	Rare
Meadows	Rare	Rare	Common

Survivors

	Brown	Pink	Green
Beech-woodland	Common	Common	Rare
Meadows	Rare	Rare	Common
Deciduous woodland — Spring	Common	Common	Rare
— Summer	Rare	Rare	Common

Anvil Stones

Casualties

Significance

1) selective agent
(active, immediate cause differential survival)

abiotic (climate, weather)

biotic (organism—here, birds)

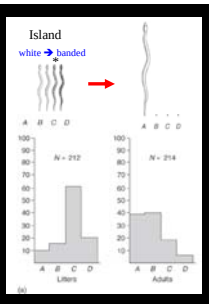
2) microhabitat

3) cyclic

Water snakes

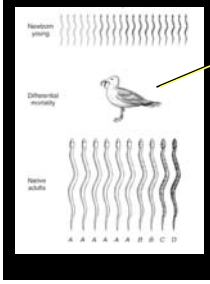
island

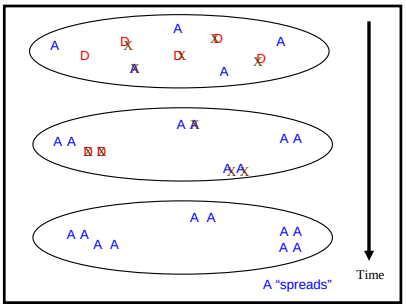
Litter = offspring number



Differential survival

Selective agent

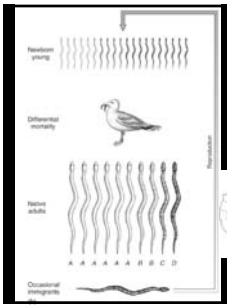


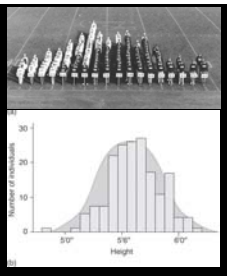


Differential survival

Migration

Microhabitat

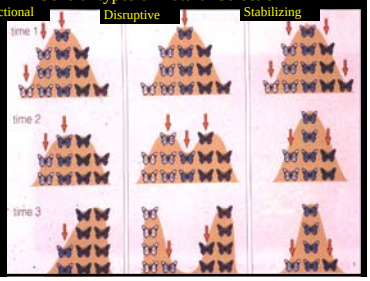




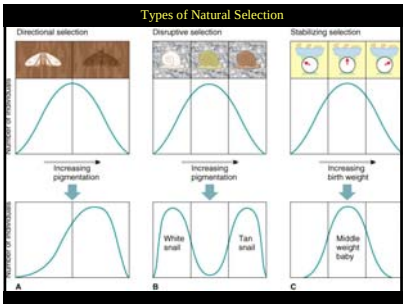
Bell-shaped curve

General types of Natural Selection

Directional Disruptive Stabilizing



Types of Natural Selection



Sexual Selection

Sexual Selection

1) sexual dimorphism ("two forms")

➔ secondary sexual characteristics

2) not special kind of selection

3) members of one sex (usually males), compete for opportunity to mate.

Sea Lions

Mandrill

Sexual selection: secondary sexual characteristics

1) Between members same sex power to "conquer" rival (male-male)

2) Between different sexes power to "charm" female (male-female)

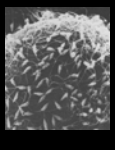
Red-winged Blackbirds

- Sexual dimorphic characters (e.g. larger body size, bright red epaulets, well developed song, high aggressiveness)
- Defend territories from other males
- Females choose best nesting sites
- Males that defend better sites = more females

Dimorphism arises from competition for mates

Males produce— sperm: cheap

Females produce— eggs, nurture, parental care: expensive



Consequence: female choice

Role Reversal

Secondary Sexual Characteristics

power to "conquer" rival males

power to "charm" female

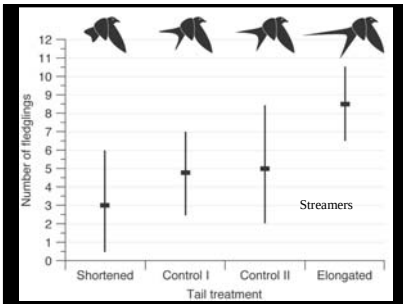
Mostly, affects evolution of male displays/ornamentations

(investment)

Not just seduction, but QUALITY

Mane

Streamers



Barn Swallows

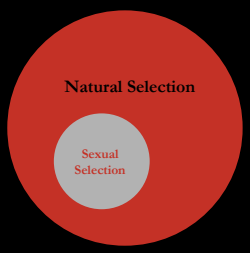
- Mites
- Nestlings in nests with high parasite loads are lighter and have lower survival rates
- Longer the streamers, the greater resistance to parasites

Overview

1) Selection happens
2) Variation

Overview

1) Selection happens
2) Variation
3) Artificial vs. Natural
4) Natural selection
   a) Types—directional, disruptive, stabilizing
   b) Selective agent—abiotic, biotic
   c) Microhabitat
5) Sexual Selection—special case of NS



Sexual Selection

a) special kind
b) resources (different sex roles)
   males—mate limited
   females—energy limited
   Thus, females choose

   males—few sperm
   females—whole reproductive effort

Sexual Selection (cont.)

c) secondary sexual characteristics

(adaptive advantage ?)

1) handicap
2) health certificate

Thus, honest signal to female of male's good genes

Sexual selection in humans

- Facial attractiveness linked to the advertisement of **"good genes"**
  - ***Symmetry*** is also seen as being attractive and as an indicator of good genes
  - ***Averageness*** is considered important as individuals with such faces are less likely to carry harmful genetic mutations