



# DARWINISM

## SELECTION THEORIES

THE THEORY OF ARTIFICIAL SELECTION

THE THEORY OF NATURAL SELECTION

THE THEORY OF SEXUAL SELECTION

# DARWINISM

- Darwinism is a theory of biological evolution developed by the English naturalist Charles Darwin (1809-1882) and others.
  - Darwin is known especially for his selection theories
- Artificial Selection
  - The process whereby the various breeds or races of domestic animals and plants have been formed by man.
  - Extremely old process, extending over at least seven thousand years.
  - Indirect evidence of evolution
- Natural Selection
  - All species of organisms arise and develop through the natural selection of small, inherited variations that increase the individual's ability to compete, survive, and reproduce.

# DARWINISM

- Sexual Selection
  - Based upon the competition or struggle for mating.
  - The female selects the most desirable male to be the father of her progeny, with the consequent inheritance by offspring of his estimable characteristics.
  - Rival male fight for the possession of a female, and the female being the passive reward of the victor.
  - E.g. The deer or the sea-lion,
- The processes of artificial selection are more or less analogous to those of natural selection and aid us to understand more clearly the methods of natural selection.

# THEORY OF ARTIFICIAL SELECTION

- Nature of the Product
- Examples of Artificial Selection
- Factors of Artificial Selection
- Limitations of Artificial Selection

# NATURE OF THE PRODUCT

- Product of Artificial Selection
  - Not suitable for wild or natural habitat
    - Struggle for existence is necessary to survive in the nature
  - Domesticated races or breeds- Only those qualities were nurtured which are useful to human
    - Most of these domestic animal would prove handicap in open competition
  - Instability of artificial selection occurs
    - Tendency to revert to the original wild type in a few generations
    - Vigilance of the breeder in prohibiting interbreeding between different varieties is relaxed



## EXAMPLES OF ARTIFICIAL SELECTION



- Classic example of artificial selection
  - The pigeons, of which more than 150 varieties, all descended from a single source
  - The range of variation in these animals is huge
- Some domestic races differ fully from the most distinct natural genera
- The rock-pigeon, *Columba livia*, regarded as the common parent form

## EXAMPLES OF ARTIFICIAL SELECTION

- Pouter, in which the body and legs are elongate and the feet are fully feathered
  - The most peculiar feature is the enormous size of the oesophagus
- The carrier pigeon, with elongated beak, neck and body.
  - Capable of most sustained flight and were used abundantly as messengers during the world wars.



# FACTORS OF ARTIFICIAL SELECTION

## (1) Unconscious selection with more or less complete isolation

- Weeding out of the unfit, a sort of lethal selection
- Less desirable animals from every point of view are eliminated
- Remaining animals permitted to breed

## (2) Conscious selection of the more desirable individuals

- Focused on larger size, plumpness, earlier maturity; great docility and fertility
- The end-product improves only a few characters



## FACTORS OF ARTIFICIAL SELECTION

### (3) Conscious selection directed towards definite or special ends

- Certain individual characteristics rather than working towards a good, all round animal;
- Only those characters are selected which strike the fancy of the breeder

### (4) Crossing or hybridizing: the crossing of two individuals is often of great benefit

- (i) Increases the range of variation,
- (ii) Adds or combines certain desirable characters
- (iii) Eliminates the undesirable

## LIMITS OF ARTIFICIAL SELECTIONS

- The wide crosses, to improve the races are not possible, crosses only of varieties of the same species are possible.
- Related species as the horse (*Equus caballus*) and the donkey (*Equus asinus*) can be bred only for one generation
  - The offspring whether mule or hinny is almost always sterile
- The artificial selection undoubtedly an important factor which gives a clue to the method of natural selection.
  - The job of selection is taken here by the breeder or gardener while in the natural selection, nature take the work on herself.