Part III (H)

Topic : Lamarkism

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* Lamarckism :

- Jean Baptiste Pierre Antoine de monet Lamarck (1744- 1829) was a French naturist.

* Biology
Invertebrate
Vertebrate
} - These terms introduce by Lamarck

* Philosophie Zoologique- written by Lamarck (1809).

Lamarckism:

- The theory was proposed by French Biologist J.B. de Lamarck in 1809, in his book 'Philosophie Zoologique'. This theory is popularly known as 'Inheritance of acquired character in organism'.

* Definition:

- The changes in structure or function of any organ acquired during the life time of an individual in response to changes in the surrounding environment are inherited by its offsprings and keep on adding up over a period of time. These changes lead to origin of new species.

* Postulates of Lamarckism:

1. New species

- changes in the environment create new needs in living organisms. So, that they are better adapted to the changed environment. The organisms have to put in special efforts for the fulfilment of the new needs.

- This efforts lead to a change in the habitat or behaviour and induce development of new organ or part of body.

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2. Aquisition of new characters:

- New characters are acquired by living beings in two ways:

(a) By use and disuse:

- The new habits involve greater use of certain organs to meet the new need and disuse or lesser use of certain other organs in changed conditions.

- The continuous use of an organ or organs keep them functional and make them stronger, Larger and more efficient.

- continuous disuse of an organ or organs leads to gradual reduction in their size and to their final appearance.

- Vestigeal organs are examples of such non-functional organs in the modern forms. These are functional in ancestral forms.

- Thus, by differential use and disuse of various body parts, an organisms would change to some extent and modifies some others.

b) Effect of enviroments:

- changes in Temperature, Light medium, food etc influence the functioning

and behaviour of living beings and introduce changes in their structure. Thus, organisms acquired certain new character due to direct or indirect influence of environment.

3. Inheritance of acquired characters:

- The characters acquired by an organism during its life time are inherited to the next generation.

- In every generation some new characters are acquired or the older ones keep on increasing or improving. As a result, after a number of generations, the species get modified into a new one.

⊛ Evidences in favour of Lamarckism:

1. Evolution of long neck in Giraffe
2. Evolution of Snakes (the legs of Snake were of no use and finally disappeared)
3. Evolution of aquatic birds:

- Aquatic birds (Ducks, Swans and Geese) have arises from terresterial ancester by
- developing web between toes for wading in water.

4. Evolution of Horse and Deer
5. Eyes are reduced in moles because they live undergrounds.
6. Muscles of Pinna are reduced in man.
7. Flightless birds are believed to have descend from flying birds.

Criticism of Lamarckism:

- Cuvier and weismann were great critics of Lamarckism.
- Objections which even Lamarck could not answer as follows-

1. The tendency to increase in size has been noted in many forms, but many time evolution shows reduction in size.
2. The new organ develop when the organism feel their need is also true.
3. The reaction to the environment may have some weightage.
4. Many experiment have discarded the theory of inheritance of acquired characters eg. If parents are blind or deaf, it is not necessary to their offspring also deaf or blind.
5. weismann, 1904, in his famous experiment cut off tails of rats for about 80 generations, but tailless offspring were never born.

6. Theory of continuity of Germplasm proposed by weismann 1892 and mendels law of Inheritance were hard blow to Lamarck's theary of inheritance acquired characters.

Neo Lamarckism :

- Alc to Neo lamarckism mainly T.H. Morgan and Cope, the acquired characters which become incarporated in the Germplasm are heritable and accumulate generation after generation resulting in the origin of new forms or new species.

* Experimentz in support of Inheritance of acquired characters :

1. Bonner transplantation experimentz
2. Tower experimentz on some Potato beetles.
3. Mc Dougall experimentz on training of rats.

* Neo Lamarckism explanations :

- Neo Lamarckisms explain the observations of various scientisz as follows—

1. Formation of germ cells from somatic cell

2. Effect of environment on germ cells through somatic cells
3. Direct effect of environment on germ cells.