

Lamarckism: it tends  
to change by some  
internal



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Lamarckism: Lamarck presupposes the theory of inheritance of acquired characters.

He made emphasis on use and disuse of parts. To him evolution is the result of adaptation of organisms to environment. The acquired characters are transmitted from parents to offspring. He systematically arranged the organisms from the simplest form to the most complex one. Lamarck wrote, 'Nature by means of heat, light, electricity and humidity, achieve the spontaneous or direct generation of organisms which exist at the beginning of both kingdoms, animal and vegetal'.

That means he accepted spontaneous generation of life.

#### **Fundamental Laws of Evolution:**

The fundamental laws of evolution of Lamarckism are as follows: (1) The size of an organism as a whole or part of it tends to change by some internal forces as per need in a given environmental condition. (2) The need is fulfilled by modification of old organs or formation of a new rudimentary organ. (3) Continued use of the organ helps it to grow little by little until full development is attained. On the other hand, disuse of the organ may lead to degeneration until it finally disappears. (4) The characters thus acquired during the life time of an individual became hereditary, that means, transmitted to the next generation.

#### **Examples:**

(1) The modern giraffes acquired long necks, because during the time of scarcity of food they had to stretch their necks to fetch the leaves at higher level of trees. Such stretching modified their necks, and made the necks

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longer in each generation, and that trait was transmitted from one generation to the other.

(2) The webbed feet of the birds developed when the birds started to live in an aquatic environment. (3) By disuse of wings certain ducks became unable to fly. (4) Cave fishes became blind because their ancestors lived in dark condition for a long time.

### **Uniformitarianism:**

Uniformitarianism is the theory presented by Charles Lyell (1797-1875) in his book 'Principles of Geology'. His theory is based on his studies of rock layers and the geological processes.

According to his theory the earth was always shaped and reshaped by geological forms from the beginning acting slowly over a long period of time. Fossil materials provide evidence to Lyell's hypothesis. This theory does not accept the idea that some Divine power radically altered the making of the earth. This idea is in contrast of the theory of catastrophist.

### **Darwinism:**

Charles Darwin (1809-1882) during his famous voyage (1831-1839) around the world on HMS Beagle collected varieties of materials and observed many events on the basis of which later on, he developed his idea of evolution. Conclusively he gave the theory of natural selection according to which those who have selective advantage tend to survive. Theory of Natural Selection: The theory of natural selection of Darwin can be put under the following major steps: 1.

There is a tendency in all organisms to increase in geometric ratio. More number of offspring's than the offspring's which can survive to reproduce are produced. 2. But the number of a given species remains more or less constant. That must be because of higher death rate.

3. Biological variations with regard to structural, physiological and behavioural traits occur among the individuals of the organism. 4. Those that have selective advantage tend to survive. They reproduce more number of offspring's than those who are less-adaptive. 5. The accumulation of advantageous traits in future generations gradually bring changes in the species and eventually a new species may be evolved. The Descent of Man: In 1871 Darwin published his book titled ' The Descent of Man' in which he dealt with in details the evolution of man.

He observed that man had evolved from some more primitive forms and that some forms gave rise to the apes as well. According to him the common ancestor of man and apes was " a hairy, tailed quadruped, probably arboreal in habits." And that common ancestor again had evolved from minute organisms of the remote past.

#### **Evidences for Darwin's Evolution Theory:**

(i) Morphology: Comparative anatomy reveals obvious similarities between the ancestors of man and that of apes, and also with that of other primates, mammals and vertebrates. All have a heart, liver, nervous system, urinary system, etc.

There are great structural similarities between man, ape and monkey, and also with regard to number of bones in the skeleton. (In the second part of <https://assignbuster.com/lamarckism-it-tends-to-change-by-some-internal/>

the book more information has been made available). The study of comparative anatomy gives sample evidences of such similarities. (ii)

**Embryology:** Another source of evidence for evolution is embryology.

Embryos of different animals exhibit very close resemblance among them. It is not easy to distinguish one from the other at a very early stage. After certain period of time embryos of the different animals start developing in their respective directions to give rise to different forms of life. (iii)

**Rudimentary Organs:** There are certain rudimentary organs or structures (vestigial) in the anatomy of living organism.

For example, at the lower end of the vertebral column of man, vestigial remains of tail bones are found, suggesting that the ancestors of man had tail at one time. These sort of rudimentary organs which appear to be functionless give clear evidence for evolutionary development.

**Pangenesis Theory:** To explain the mechanism of heredity and the origin of variations Darwin proposed a theory called Pangenesis theory. According to this theory all parts of the body generate some minute particles known as gambles. The gambles are carried to the reproductive organ by the blood and deposited in the sex cells. The sex cells carry these gambles to the next generation. After fertilization the gambles reproduce the same kind of cell, tissue, organ, etc. But at that time Gregory Mendel had already explained how the traits are inherited.

#### **Weaknesses of Darwinism:**

Some major weaknesses of Darwin's theory are given as follows: 1. One was lack of adequate fossil data as evidence for human evolution during his time. However, in 20th century numerous fossil materials have been discovered to <https://assignbuster.com/lamarckism-it-tends-to-change-by-some-internal/>

give ample evidence for human evolution. 2. Darwin was unable to explain the mechanism of heredity and the origin of variations.

### **Neo-Darwinism or Synthetic Theory of Evolution:**

The synthetic theory of evolution synthesized various concepts such as Darwin's natural selection, Mendel's genetics, mutation theory and population genetics to understand the course and mechanism of evolution. Theodosius Dobzhansky (1900-1975) was the pioneer among others to review and synthesize the different concepts of evolution. In Darwinian concept the whole population is considered as a unit of study, while in Mendel's concept individuals are given more importance. Thus, there seems to be some sort of conflict between the two. This condition prevailed till 1920s. But by 1930s, the subject of population genetics developed, and that resolved the matter.

In population genetics the gene pool of a population is the main subject matter of study to understand evolutionary changes. The change in gene frequencies over time in a population is regarded as evolution by population geneticists. They identify four basic factors to cause change in gene frequency. These are: mutation, natural selection, gene flow and genetic drift.