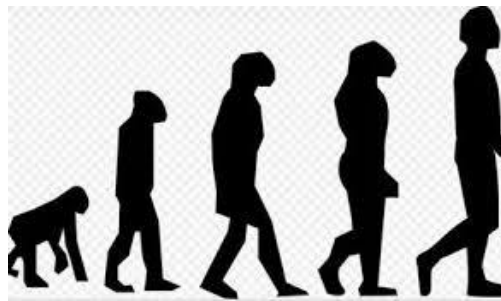


Evolution: Theory of evolution

❖ What Is Evolution?

Evolution is the study of the different forms of life, its characteristics and the changes over several generations. It is the scientific theory used by biologists to study the genetic variation in a population.

There are many theories about how life originated on the planet Earth. The theory of evolution is based on the idea that all species are correlated and progressively vary with time.



❖ What is the Theory of Evolution?

The theory evolution is one of the most important scientific theories that has formed the basis for the study of biology, anatomy, physiology, and many other branches. According to the main concept of the theory of evolution, the species of beings tend to change with the passing of time. There could be many different ways in which a species can change. However, most of them have been described in the best way with the help of natural selection theory.

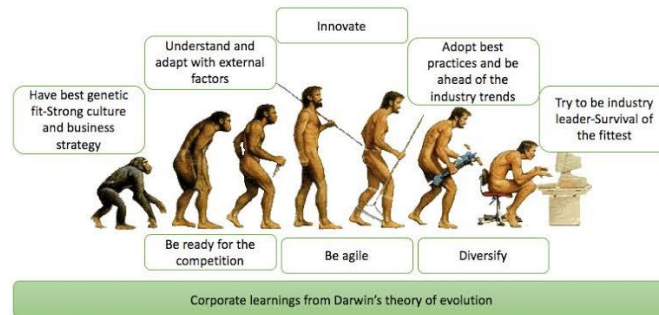
The natural selection theory of evolution not only puts a perspective on the change that is brought forth in the species through time but also the mechanism with the help of which it happens. From this article, students will be able to figure out what is the theory of evolution and what are the different theories that have been postulated about evolution.

❖ Darwin's Theory of Evolution

Charles Robert Darwin, an English naturalist, geologist, and biologist, is well known for his theory of evolution and the process of natural selection. He gave the theory of evolution, which is known as 'Darwin's theory of natural selection', and also published a book on "Origin of Species by Natural Selection". The main features of Darwin's Theory are as follows:

- All organisms reproduce and multiply enormously.
- No two individuals are alike. They are different from each other either in size, shape, behaviour, etc.
- Some traits are consistently passed on from their parent to the offspring.

- The rate of reproduction varies in all living species. Some reproduce more and some minimum.



❖ A Brief Account of Evolution

According to several theories of evolution:

- The first cellular forms of life appeared on Earth about 2000 million years ago.
- Later single-celled organisms, multicellular forms, and invertebrates were formed and became active.
- Jawless fish evolved, and different organisms started to invade from water to land. Later, amphibians and reptiles, some of them viviparous mammals, came into existence.
- About 23.03 to 5.333 million years ago, evolved primates that resembled today's gorillas and chimpanzees. During the ice age between 75,000-10,000 years ago, modern Homo sapiens arose.

❖ Evidence for Evolution

- It indicates the paleontological evidence, which denotes that life forms have arisen at various instances in the Earth's history, which covers fossils, rocks from sediments, etc.
- Ernst Haeckel proposed embryological support for evidence which was based upon the observation of some traits during the embryonic stages that persisted in all vertebrates that are not found in adults.
- The proposal was disapproved by Karl Ernst von Baer as he noted that embryos do not go through the adult phases of other animals.
- Divergent evolution is used to refer to the animals having the same structure developed along different directions as a result of adaptations to different needs. The structures are referred to as homologous, where homology represents common ancestry. Example – The tendrils and thorns of Cucurbita and Bougainvillea indicate homology.
- Convergent evolution refers to different structures evolving for the same function, thereby having similarities. This is why analogous structures are a result of convergent evolution. Examples of analogy – Flippers of Dolphins and Penguins.
- It was indicated that entities in a mixed population could adapt better, survive and cause an increase in the size of the population. But none of the variants got wiped out completely.

- Examples of evolution by anthropogenic action are the appearance of resistant cells/entities in a time span of months or years as opposed to centuries.
- Through this evidence, it was also indicated that evolution is not a directed process in the context of determinism; rather is a stochastic process basis the chance events in nature and chance mutations in entities.