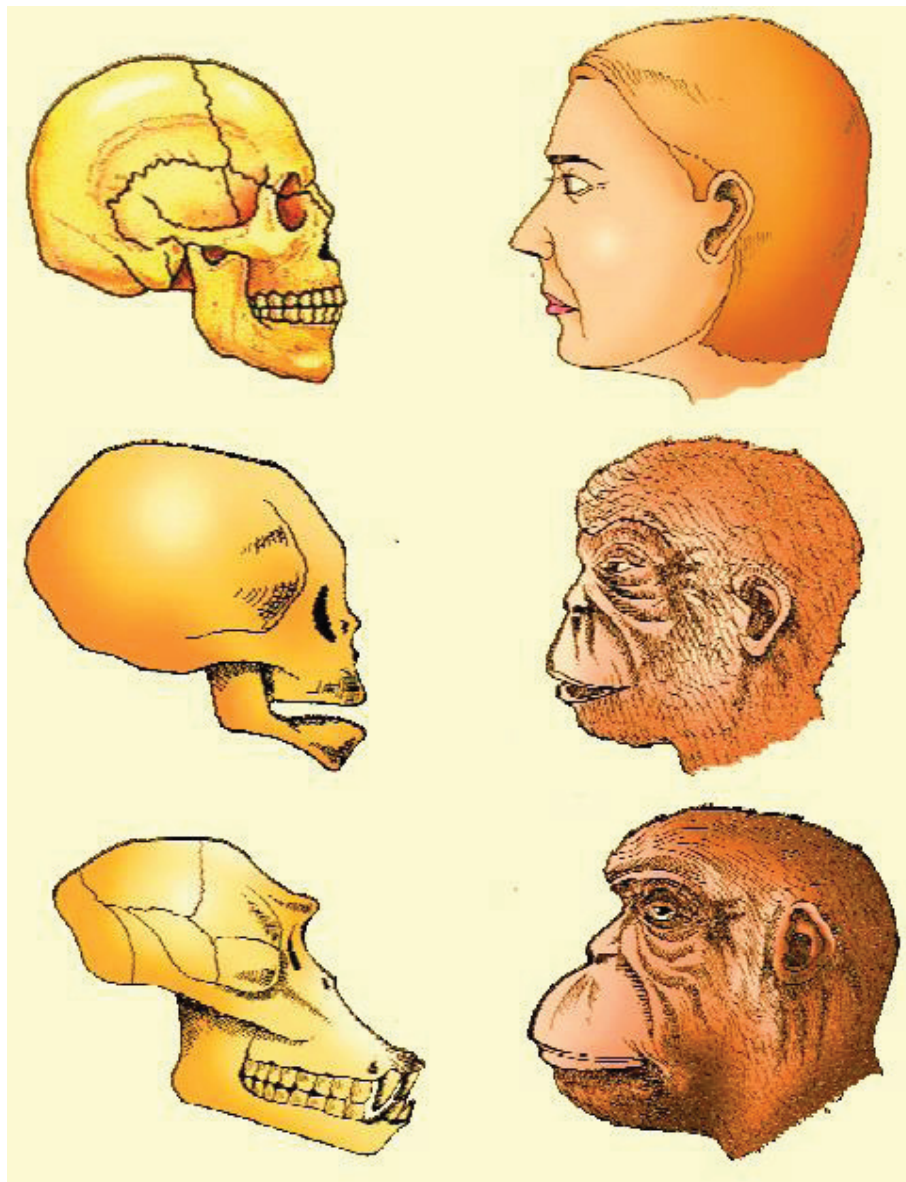


EVOLUTION



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EVOLUTION

Origin of Life:

- The origin of life is considered unique events in the history of universe. Huge cluster of galaxies comprises the universe. Galaxies contain stars and clouds of dust and smoke.
- Big Bang Theory attempts to explain the origin of universe. According to this theory, a huge explosion occurs that forms the different galaxies.
- In solar system of Milky Way galaxies, earth has been supposed to be formed about 4.5 billion years ago. There was no atmosphere in early earth. Water vapour, methane, carbon dioxide and ammonia released from molten mass covered the earth surface.
- UV rays from sun splits the water into hydrogen and oxygen. Life appeared 500 million years after the formation of earth.

There are different theories regarding the origin of life on earth:

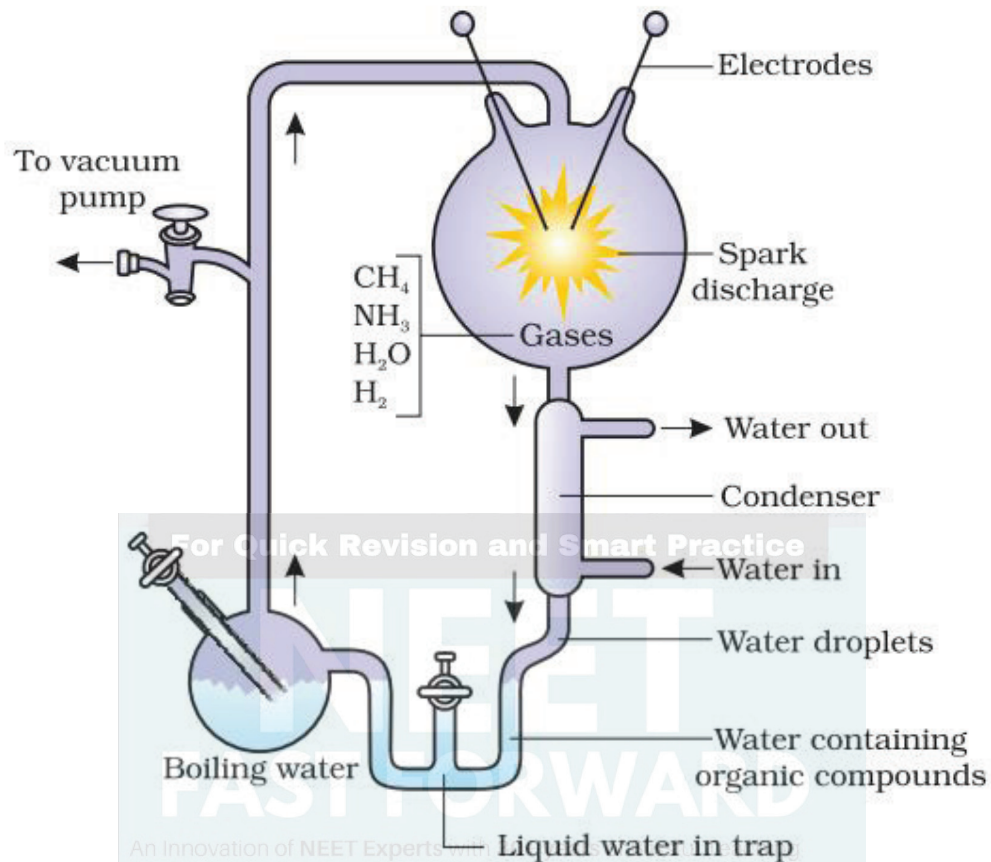
- Some scientist believes that life comes from other planets. Early Greek thinker thoughts that unit of life is called spores transferred from other planets.
- According to other theory, life comes out of dead and decaying matters like straw and mud. This theory is called theory of spontaneous origin.
- Louis Pasteur experimentally proved that life arises only from pre-existing life. Spontaneous theory of origin of life is dismissed after that.
- Oparin and Haldane proposed that the first form of life could have come from pre-existing non-living organic molecules like RNA and protein etc. The formation of life preceded by chemical evolution. At that time condition on earth were- high temperature, volcanic eruption, reducing atmosphere containing CH_4 and NH_3 .

Experimental representation of Miller's experiment:

- Miller experiment of Origin of Life- S.L. Miller in 1953, conducted an experiment to show the origin of life on earth in the physical environment similar to condition prevails at that time.
- Miller created similar condition of temperature and pressure in laboratory scale. He created electric discharge in a flask containing CH_4 , H_2 and NH_3 and water vapour at 8000°C .
- He observed formation of amino acids in flask after 15 days of electric discharge. Similar experiment by other scientist found formation of sugars, nitrogen bases, pigments and fats.
- Analysis of meteorite content also reveals similar compounds that reveal that similar process are occurring elsewhere in the space. This experimental evidence about the origin of life is called chemical evolution of life.
- The first non-cellular forms of life could have originated 3 billion years back.

They could have been giant molecules like RNA, Protein, and Polysaccharide etc.

- The cellular form of life was probably single cell and originates in water medium. The theory that first form of life arose slowly through evolutionary forces from non-living molecules is called biogenesis.



Darwin Theory & Natural Selection:

Charles Darwin concluded that existing living forms share similarities to varying degrees not only among themselves but also with life forms that existed millions of years ago. Many such life forms do not exist anymore. There has been gradual evolution of life forms. according to Darwin, refers ultimately and only to reproductive fitness. those who are better fit in an environment, leave more progeny than others. will survive more and hence are selected by nature. He called it natural selection Alfred Wallace, a naturalist who worked in Malay Archeipelago had also come to similar conclusions around the same time. All the existing life forms share similarities and share common ancestors. The geological history of earth closely correlates with the biological history of earth.

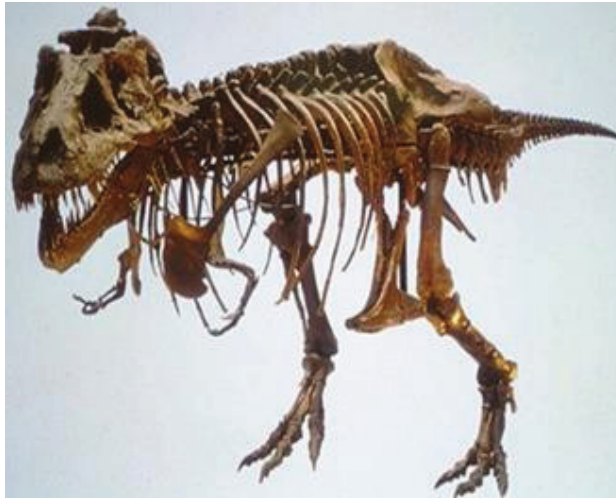
Evidence of Evolution:

Evidence that evolution of life forms has taken place on earth have many proofs as mentioned below:

Paleontological evidence:

Paleontological evidence different aged rock sediments contain fossils of different

life forms that probably died during the formation of particular sediment. Fossils are remains of hard parts of life-forms found in rocks. The study showed that different form varied over time and certain life forms are restricted geological time span. Hence, new forms of life have arisen at different times in history of earth.



Homologous organs: Homologous organs those organs that perform different function but have similar origin and structure are called homologous organs. For e.g. human, cheetah, bat and whales share similarities in pattern of bones of forelimbs although these forelimbs perform different functions in these animals. In these animal similar structure developed along different directions due to adaptation of different needs. This is called divergent evolution.

Homologous structures: Homologous structures are organs or skeletal elements of animals and organisms that, by virtue of their similarity, suggest their connection to a common ancestor. These structures do not have to look exactly the same, or have the same function. The most important part, as hinted by their name, is that they are structurally similar.



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