

**Chapter – 8**

**THE PATHS TRAVERSED BY LIFE**

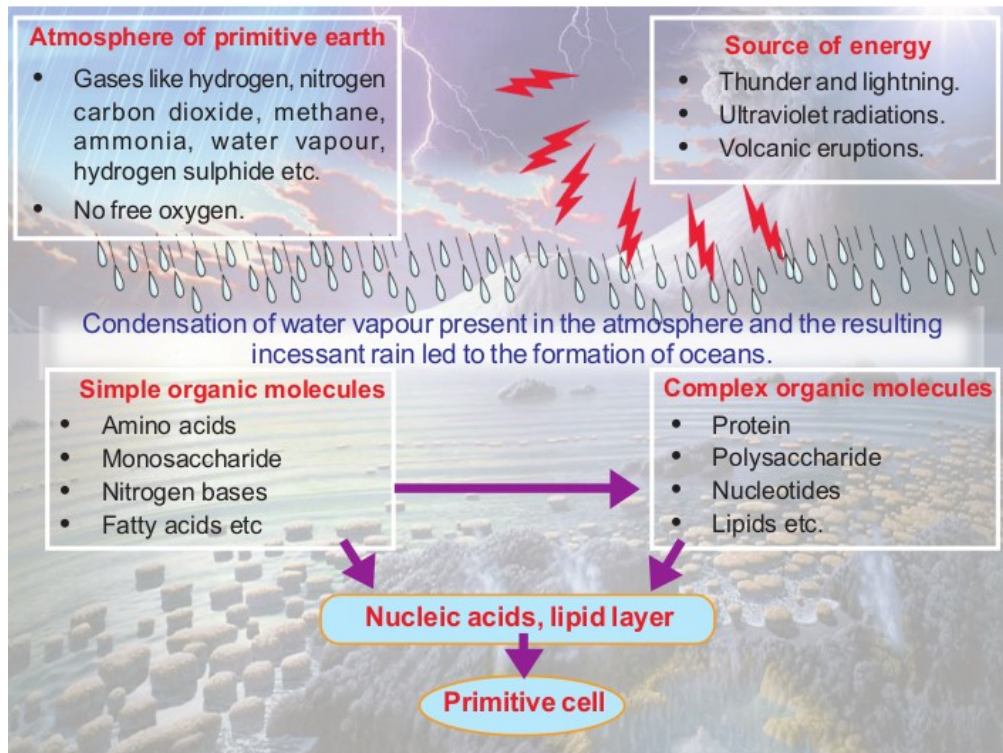
- The presence of different kinds of plants ,animals and microorganisms on earth is called **Biodiversity**
- How did the planets, including earth originate?
- How might have life originated?
- Is there life on other planets?
- All such questions have always come under the purview of scientific enquiry.
- Science has been able to put forth certain hypotheses on how earth and life on earth originated.
- **Two important theories widely discussed on the origin of earth were :**
  - **The Chemical evolution** theory that was formed about 4500 million years ago,
  - **The Panspermia hypothesis**
- The **Panspermia hypotheses** argues that life originated in some other planet in the universe and accidentally reached the earth.
- The organic substances obtained from the meteors that fell on earth support panspermia hypotheses

**Theory of chemical evolution**

- The hypothesis that evolved into the theory of chemical evolution says that the life originated as a result of the changes that occurred in the chemical substances in seawater, under specific conditions in primitive earth.

- The Russian scientist A.I. Oparin (1924) and the British scientist

J.B.S.Haldane (1929) are the proponents of this theory.



- Atmosphere of primitive earth had Gases like hydrogen, nitrogen, carbon dioxide, methane, ammonia, water vapour, hydrogen sulphide etc.
- But there was No free oxygen(O<sub>2</sub>) Oxygen was present in the form of compounds like water vapour and carbon di oxide.
- Source of energy present in the Atmosphere of primitive earth were Thunder and lightning, Ultraviolet radiations, Volcanic eruptions.
- A large amount of energy will be released from these sources which lead to certain chemical reactions that took million of years.
- Condensation of water vapour present in the atmosphere and the resulting incessant rain led to the formation of oceans.

- Simple organic molecules (life supporting molecules ) like Amino acids, Monosaccharide, Nitrogen bases , Fatty acids etc were formed in the oceanic water as result of chemical reactions in the atmosphere.
- From simple organic molecules Complex organic molecules like Protein ,Polysaccharide Nucleotides ,Lipids etc. were formed.

**Aminoacids --> Protein**

**Monosaccharides --> Polysaccharides**

**Nitrogen base --> Nucleotide**

**Fatty acids --> Lipids**

- Complex organic molecules combined to form nucleic acids with lipid covering.
- Primitive cell (First cell ) was formed .

### **Evaluation**

- 1) Prepare a short note on:
  - a. Theory of chemical evolution
  - b. Panspermia hypotheses
- 2 ) Prepare a flow chart on the important steps of theory of chemical evolution.

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