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B.Sc HONS Part-III Paper - VII

Topic: Describe the mode of fossil's formation and their age determination

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Q. 2 Describe the mode of fossil's formation and their age determination.

Ans. The fossils are found only in the stratified rocks. Which have been formed by slow deposition in water of sand, clay, mud or lime formed by the weathering of igneous rocks as a result of action of head cold wind and rains. During the process of this type of rock formation at the beds of great seas countless marine animals and plant after death, have been sinking to the bottom becoming embedded in the sediments. Some land plants and animals also, after death were carried by rivers to lakes or ocean and got embedded in sediments. They were changed to fossils. The metamorphic rocks are formed from the above two groups by changing their texture and composition. This change is caused by weight, pressures, heat and movement.

Fossilization : Fossils are of various types :

(i) Petrified Fossils : In this type of fossils as a result of petrification the organic matter of a dead animal or plant is replaced particle by particle by mineral matter. In petrification, quartz, limestone or iron pyrites are used.

(ii) Dead and Preserved Bodies : The actual dead and preserved bodies or parts of bodies, of animal and plants with the original tissue intact and enclosed either in ice or in amber or else memified in various ways form one class of fossils. From the arctic ice, almost fresh bodies of mammoths, dead thousands of years ago, have been recovered. Several species of ants and insects have been preserved in amber especially found on the shallow coasts of the Baltic sea. Several mollusc-shells, teeth of sharks, bones of animals have been found in well preserved condition.

(iii) Casts and Impression : Sometimes an animal or plant that has laid in mud or clay long enough to have left its impression, the mud hardens about the body and forms a mold, the organic matter disintegrates and the mold is filled with hard mineral matter and the matrix may then be removed so as to leave the perfect cast.

(iv) Pseudofossils : Many objects of inorganic origin closely resemble the forms of organic origin and are found in the sedimentary rock. These are called pseudofossils.

(v) Coproliths : These are structures which represent fossil casting or excreta.

(vi) Gastroliths : These are present in the body cavity of certain reptiles. These structures are believed to have been of some use in grinding the stomach contents of the extinct reptiles.

Method for Age Determination : The age of fossil is determined by following way :

The element uranium changes to lead by a long process of transformation. When uranium and lead occur together in the form of small nodule in a fragment of sedimentary rock, it may be assumed that rate at which uranium changes to

lead is independent of the conditions under which it occurred. It has been calculated that 7400000000 gms of uranium yield one gm. of lead eq. per year. In this way the age of a piece of rock containing uranium and lead can be determined from the following formula,

$$\text{Age of the rock} = \frac{\text{wt. of lead}}{\text{wt. of uranium}} \times 7400 \text{ million years.}$$