

Prof ANIL KUMAR Zoology

B.SC HONS Part-III Paper - VII

Topic:- Write an essay on Fossil

Prof ANIL KUMAR

Associate Professor Zoology

R.R.S College MOKAMA (P.P.U)

Q. Write an essay on Fossil.

Ans. Fossil is defined in Encyclopaedia Britannica as "Since the time of Lamarck reserved to include only the remains or traces of plants and animals, preserved in any natural formation whether hard rock or superficial deposit, not only petrified structures of organism but whatever was directly connected with or produced by these organisms".

Since most of the fossils are formed by the burial of the dead organisms and the depth of the fossil increases due to more and more sediment being laid down above them. The oldest fossil may therefore, be expected to be found in the deepest layers of the earth's surface while superficially located fossils may be regarded as recent in origin.

Methods of Fossilization : Fossilization might take the following courses—

1. Most common method of fossilization is burial in the sediments. These are continuously deposited on the floor of the oceans and other large bodies of water. After death the aquatic organisms fall into the deep sedimentary deposits, where they are protected from oxidation and scavengers. The soft parts decay and are carried by water. The hard parts including the bones may either remain as such or are replaced gradually by the minerals of the water. The layers of sediment are deposited due to the continuity of the process and grows ever thicker. Its lower portions gradually harden into rocks.

2. The dust storms can also have the same effect. It will be most effective in causing fossilization of terrestrial organisms.

3. Volcanic ash may also bury organisms and preserve them as fossils.

4. The hot and desert winds may dry desert forms and these are buried under the shifting sands.

5. Sometimes petroleum spring helps because evaporation of more volatile oils produce in the beginning a sticky tar and later on viscous asphalt. At Rancho LaBrea in southern California it has happened many pleistocene and recent mammals and birds and one amongst the best preserved fossils.

6. The entrapment of insects in amber is another method of fossilization. These are perfectly preserved and give even histological details.

7. Organisms may be fossilized by petrification. Here the actual tissues may be replaced particle by particle and by minerals in waters of the locality. Iron pyrites, silica, calcium carbonate and other carbonates are principal minerals utilized in this type.

Types of fossils—

1. Petrifications.
2. The mold.
3. The cast.
4. The impression.
5. The film of carbon.
6. The frozen specimens.
7. The amber fossils.

Conditions for fossilization : Fossilization is effected due to certain conditions which can be studied as following—

1. Burial : The first pre-requisite for fossilization is the burial but during this burial air should be excluded so that the oxidation of the organism may be prevented. The water borne sediment derived from the degradation of older rocks, affects the burial.

The sediments of primary importance are those deposited in the sea oceans mainly in the shallower regions. Deposits of fresh water normally come from river baron delta although lakes and ponds also contribute their amount. The fossils of terrestrial forms is yielded by wind-borne material in the form of loess and volcanic ash.

2. Miring : The miring (entangling and plunging into mud) causes death and burial and forms a good method of preservation. Miring might occur in quick sand or swamps (bogs). Elephas, Mastodon and mylodon, the large sized mammals have been entrapped this way.

A good example is mastodon found in Newyork in good numbers remain of great Irish elk are common in Peat bogs or Ireland. But Ranchola-Brea lying on the western border of Los Angeles, California, forms the most remarkable death trap in the world.

The asphaltic oil in the crude form found in the underlying slater rocks (e. g. infernando) comes to the surface through cracks and chimneys and it forms extensive oil pools on the surface of earth. The natural distillation of this oil resulted in more viscid state, which is sufficiently tenacious to entrap organisms.

3. Subsequent viscidities or Mutabilities : There are some mutabilities or changes to which the resultant fossil is subjected. After having fulfilled the

initial conditions or preservation, these mutabilities occur as the time goes on and are due to pressure, elevation, folding and the subsequent erosion of the strata. The fossil is also subjected to the rocks.

Sometime the water dissolves the shells or bones of the animal and only a mold may be left or may become unrecognisable as remain of organic life.

Significance of Fossils : (1) The character of the fossil contained in a rock and minerals, indicates conclusively the geologic age of the rock.

(2) Fossils indicate the extent and boundaries of former lands and waters.

(3) Variation of degree of moisture and temperature is most clearly indicated by the fossils.

(4) A new branch of biology. The paleobotany and paleo zoology is given rise by the study of fossils.

(5) Study of fossils enabled Prof. Schuchert to raise paleogeography to the status of science.

(6) The study of evolution of different animals including man the definite times of their ancestry is only supported by the study of fossils.