

B.Sc. Part III Zoology (Hons)

Paper VII.
Micro, Macro and Megaevolutions (Part II)

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Contd. from Part I -

The populations undergoing macroevolution are constantly experimenting within the adaptive pathway and parallel proings of a new enzyme by selected best different lines on the rule. The classical example of this kind of evolution is exhibited by the Evolution of Horse. In Constructing the phylogeny of an animal group, it has been the standard practice to show the emergence from a central, generalized stock of a large no. of divergent branches or lineages. Not all branches persist; indeed the general rule is that all but a few persist. The disappearance of many branches in the past might lead to obscure today to the mistakes impression that the evolution of a particular group was not at all elaborated forked. Thus, the evolution of horses could be

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erroneously depicted as an undivided straight line from progenitors from the small terries (small dogs of various breeds) size hyracotherium. (Eohippus) to the large modern Horse (Equus).

Principles of Macroevolution :-

The following common features have been derived from phylogeny of Horses regarding macroevolution.

1. Macroevolution follows the acquisition of new general adaptations or entrance into a new adaptive zone. e.g. Darwin's Finches radiated after an apparently generalized finched ancestor arrived to occupy the previously unoccupied Galapagos Islands. Reptiles radiated after completely Terrestrial Development was established as general adaptation.
2. Macroevolution always involve evolutionary divergence. It is not linear, but radiating. usually radiation follows general adaptation and the invasion of a new adaptive zone through special adaptation in different divergent decendent lines.
3. Adaptive Radiation or Macroevolution tend to produce evolutionary lines that converge in special adaptation with other distantly related groups differing in their pattern of general adaptation. e.g. Ichthyosaurs show a marked evolutionary convergence.

with a no. of fish groups in the body form, manner of locomotion, food habits and free swimming pelagic life. They are convergent in special adaptations, but still share a group of general adaptations with all other reptiles.

(4) Macroevolution produces groups of parallel special adaptations among divergent and related stocks. All of them have a common general adaptation. Among reptiles, groups representative of every order except the p. cotylosaurus had invaded aquatic adaptive zones and become completely aquatic. Among these, some groups flourished and later become extinct. These groups were replaced by other parallel groups which invaded the same zone and underwent differentiation. This provides an example of parallelism or Ecologic Replacement.

(5) Macroevolution ultimately leads to extinction. Some groups acquired special adaptations for a narrow adaptive sub-zone and due to this specialized adaptation, they could not move into new major zones, because all adaptive zones finally change and disappear so all groups restricted to a narrow zone also disappear. Hence the groups which could change the adaptive zones by acquiring general adaptations survived and others became extinct.

3 // Megaevolution :- Megaevolution or the origin of new biological organisations plus is rare and shares features common to microevolution and macroevolution. Only a few major general types have developed during the history of life. But almost all of them persist without extinction, although a few have perished as others are relict. All of the phyle and most classes of microorganisms, plants and animals represent marvellous complex and co-ordinated groups of general adaptation each forming a basic distinctive biological organisation, plus are known to have developed in the last three billion years. The origin of these systems, to the most significant of all evolutionary events, yet the processes leading to the events remain the least studied of biological problems. It has following characteristics —

(i) The breakthroughs always follow evolutionary experimentation, exploring and by divergent lines of the ancestral stock, until one of the crosses the ecologic barrier into a new zone.

- (ii) The breakthroughs and shift are always rapid: otherwise they fail because of the extreme negative selection in unstable ecologic zone,
- (iii) The new zone is always ecologically accessible, is devoid of competitors and requires a new general adaptive type for its invasion.
- (iv) Adaptive radiation always follows the initial shift.

Conclusions

Hence, it can be concluded that microevolution stands for small genetic variations, while macroevolution is a progressive, sustained tendency for certain characters to develop along an evolutionary line. While, macroevolution stands for significant changes in progressive and sustained tendency for certain characters to develop along an evolutionary line. Although, Macroevolution stands for changes on a large scale which are seen. It only shares features common to micro and Macroevolution.

