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B. SC HONS Part - III Paper - VII

TOPIC:- Write short notes on the following.

1. Physiological Isolation
2. Ecological Isolation.
3. Genetic Drift
4. Wallace's Line

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**1 Physiological Isolation :** Certain species are established only on the basis of some physiological differences developed between them. For example, in certain species of *Drosophila*, mating among the members of different species is not possible because vaginal mucous membrane swell up after copulation. The swelling lasts for few hours if mating is among the members of the same species, but continues for days, if the mating is interspecific.



**2 Ecological Isolation :** The ecological niche is a particular combination of microhabitat and biotic relations required for the existence of a species. The niche of a species is defined by the features of the substratum, ad microclimate to which that species is mainly active, the type of shelter or cover it requires the manner in which it uses vegetation in its reproductive performance, the type of food it consumes, and the predators the prey on it, Segregation of species into different niches is doubtless the result of interspecific competition. According to Gause's rule and ecological niche cannot be simultaneously and completely occupied by stabilized populations of more than one species. Occupancy of different niches reduces interspecific competition, furnishes the species with microhabitats to which they are specially adjusted, reduces confusion and disturbance and permits a greater variety of species to occur in the same region.

**3 Genetic Drift :** In breeding within small isolated populations may bring into prominence traits that are expressed only irregularly and inconspicuously within the species as whole. Those establishment of restricted genotypes in small populations by loss of genes or accidental changes in frequencies at which certain genes occur is called genetic drift.

The possibility that genetic drift is a significant factor in speciation under some conditions is shown by ground finches of the calapagos islands. These species differ mainly in the size and shape of the bile. Differences in bile characteristics apparently developed as small populations became isolated on different islands within the calapagos group, even though the islands were similar in climate, vegetation and haditats generally.

**4. Wallace's Line :** In the middle of nineteenth century, when the world was divided into six Zoogeographical Regions, it was found difficult to draw an isolating line between Oriental and Australian Regions. The mainland masses of the two regions are separated from one another by several island, the malays Archipelago. The tussel was for the division of the island into these two regions.

From the study faunal regions it is evident that the large island of Sumatra, Java and Borneo belong to Oriental Region. They are separated from malaya and from one another by a shallow sea. Also the animals found on them, are similar to those found in Malaya. But New Gunca and the Aru island are close to Australia and are surrounded by a separate shallow sea area. Their fauna is similar to Australian continent. These were, therefore, assigned to Australian Region. As a result of this separation Phillipines, Celebes, Moluccas, Timor and several other similar islands were left without a definite position.

Wallace, while studying the fauna of Malaya Archipelago found that the fauna of Bali and Lambok separated by a distance of about twenty miles was markedly different from one another. This inspired him to study the fauna of other inland of this region like Celebes, Kei island, Aru, Timor Moluccas and New Guinea and separated them into Oriental and Australian Regions. In 1863 he drew a line on the map separating these islands into two regions. This line became popularly known as the Wallace's line after the name of its originator.

The Wallace's line runs between Philippines and Moluccas in North between Borneo and Celebes south-west and between Bali and Lombok south wards.



Some years after the Wallace's line was drawn WEBER drew another line more eastwards separating Moluccas from Celebes and Kei islands from Timor. This line was known as Weber's line. There are two school of Zoogeographers, one prefers Wallace's line. There are two school of Zoogeographers, one prefers Wallace's Line where as other approves of Wabe's line Geographically, Wallace's line mark of the eastern limit of what was once a land mass joined to Malaya, whereas weber's Line mark off the western limit of what was a part of Australian continent at one time.

The problem can be solved by assuming that Celebes, Flores and Lombok island have transitional fauna. Most of them were probably under the sea for most of the Coenozoic period, there by loosing all their earlier flora and fauna. They reappeared as independent island neither connected to Oriental nor Australian.