1. From a plant’s evolutionary view point, however, it was also a land of opportunity, free of competitors and predators and full of carbon dioxide and sunlight (the raw materials for photosynthesis, which are present in far higher concentrations in air than in water).

○Terrestrial plants had the advantages of not having rivals and having easy access to photosynthetic material

○The abundance of photosynthetic material made life on land easier for pioneering plants

○Once plants had eliminated their competitors and their predators, their evolutionary process proceeded smoothly.

○Plant evolution eliminated competitors and made the process of photosynthesis more efficient.

2. In 1972 paleontologist Stephen Jay Gould and Niles Eldredge challenged conventional wisdom with an opposing viewpoint, the punctuated equilibrium hypothesis, which posits that species give rise to new species in relatively sudden bursts, without a lengthy transition period.

○ The punctuated equilibrium hypothesis challenged gradualism, which holds that species evolve in relatively sudden bursts of brief duration.

○ The punctuated equilibrium hypothesis developed by Stephen Jay Gould and Niles Eldredge was challenged in 1972.

○ In 1972 Stephen Jay Gould and Niles Eldredge challenged gradualism by positing that change from one species to another cannot occur without a lengthy transition period.

○ The punctuate equilibrium hypothesis, in opposition to gradualism, holds that transitions from one species to another occur in comparatively sudden burst.

3. However, no group or species can maintain its dominance indefinitely, and when, after over 200 million years, the age of dinosaurs came to a dramatic end about 65 million years ago, mammals began to flourish, evolving from relatively few types of small terrestrial animals into the myriad of diverse species, including bats and whales, that we know today.

○The dominance of dinosaurs came to an end 65 million years ago, at which time mammals began to flourish and diversify.

○Because no group of species can remain dominant forever, mammals became the dominant group when dinosaurs became extinct.

○After being the dominant group for more than 200 million years, the age of dinosaurs came to a dramatic end 65 million years ago.

○The diverse group of mammals that we know today, including bats and whales, evolved from small terrestrial forms that had been dominated by dinosaurs.

4. With "climax," "biome," "superorganism," and various other technical terms for the association of animals and plants at a given locality being criticized, the term "ecosystem" was more and more widely adopted for the whole system of associated organisms together with the physical factors of their environment..

○Unlike the terms “climax”, “biome,”and “superorganism,”which refer to the particular association of plants and animals at a given location, the term “ecosystem”refers specifically to the physical factors within an environment.

○The terms “climax,”“biome,”“superorganism,”and “ecosystem”all refer to the system of plants and animals in an associated environment, but some are more controversial than others.

○When the older terms of ecology became too technical, they were replaced by the more popular and more widely used term “ecosystem.”

○The term “ecosystem”gradually replaced discredited terms for the combination of a physical environment and the plants and animals living together in it.

5. Graves drew two conclusions from these observations. First, at least some of the observed differences between the enzymes of the Atlantic and Pacific fish populations were not random but were the result of evolutionary adaptation. Second, it appears that closely related populations of fishes on both sides of the isthmus are starting to genetically diverge from each other. Because Graves’s study of geographically isolated populations of isthmus fishes offers a glimpse of the beginning of a process of gradual accumulation of mutations that are neutral or adaptive, divergences here might be evidence of allopatric speciation in process.

○Graves’s study provides evidence that isthmus fishes are in the process of becoming geographically isolated.

○Graves’s study of mutating isthmus fishes yields results that differ from results of other studies involving allopatric speciation.

○Graves’s study of isolated populations of isthmus fishes provides some evidence that allopatric speciation might be beginning.

○Graves’s study indicates that when isolated, populations of isthmus fishes register neutral or adaptive mutations.