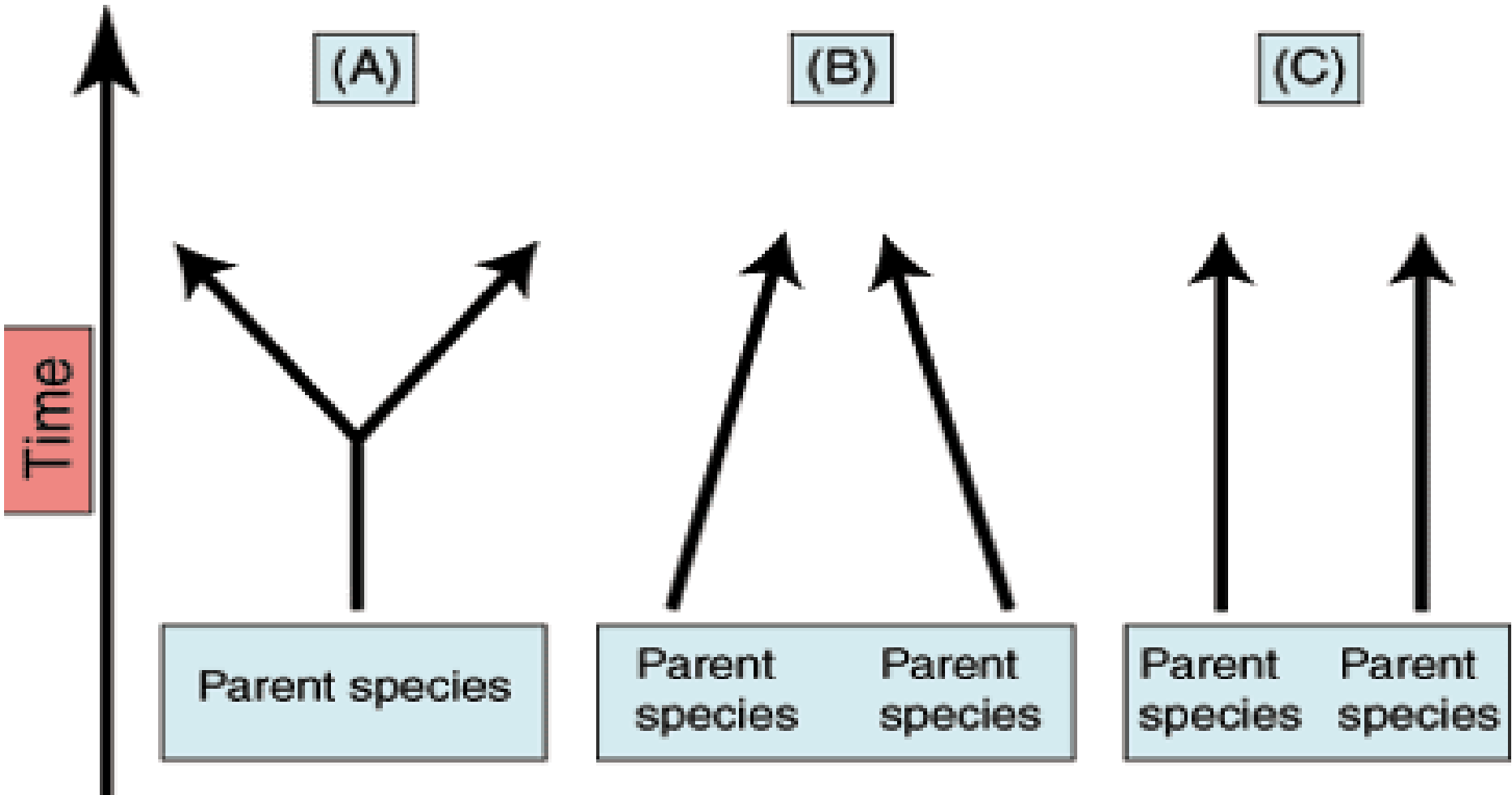


Types of EVOLUTION

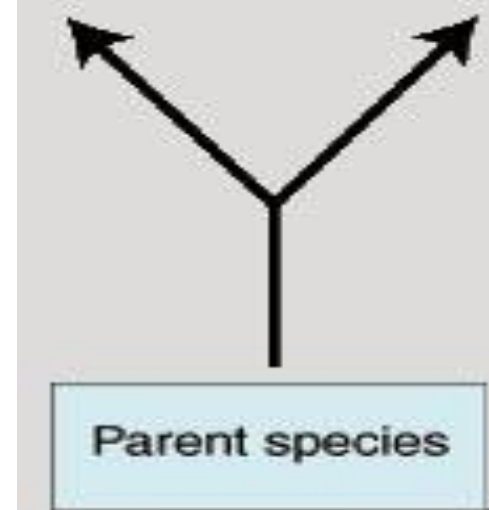
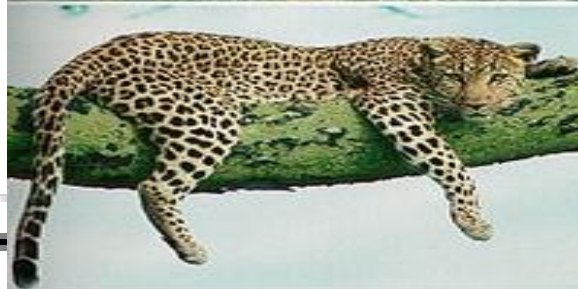
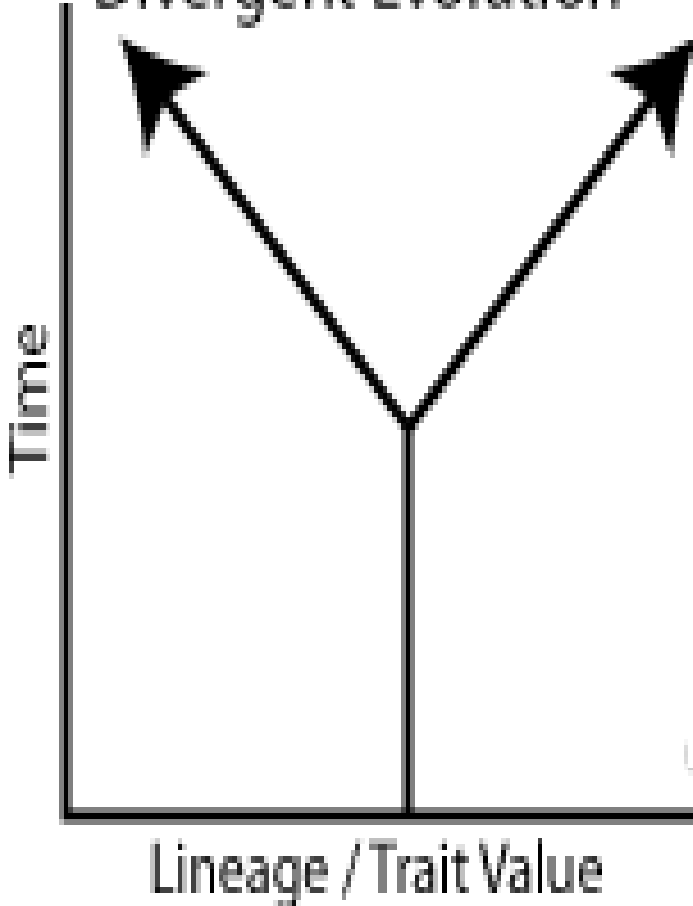
Divergent vs. Convergent



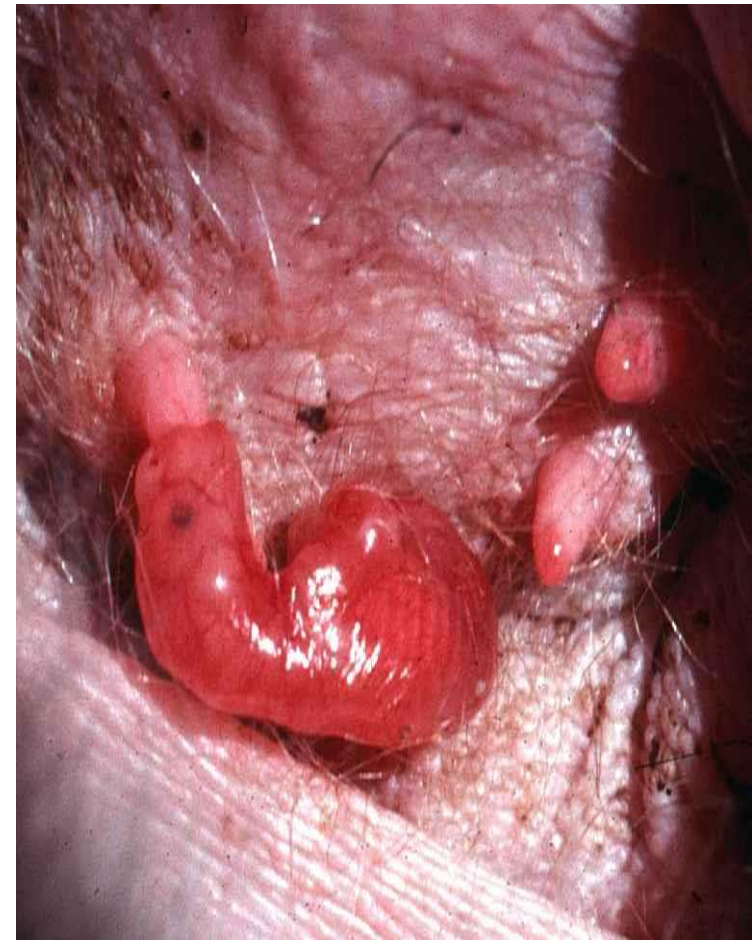
DIVERGENT EVOLUTION

- To Diverge means to spread apart. Think of other words that use the same root word. “Dissect, Divide, Divorce”
- Could two or more different species have shared a common parental species?

Divergent Evolution

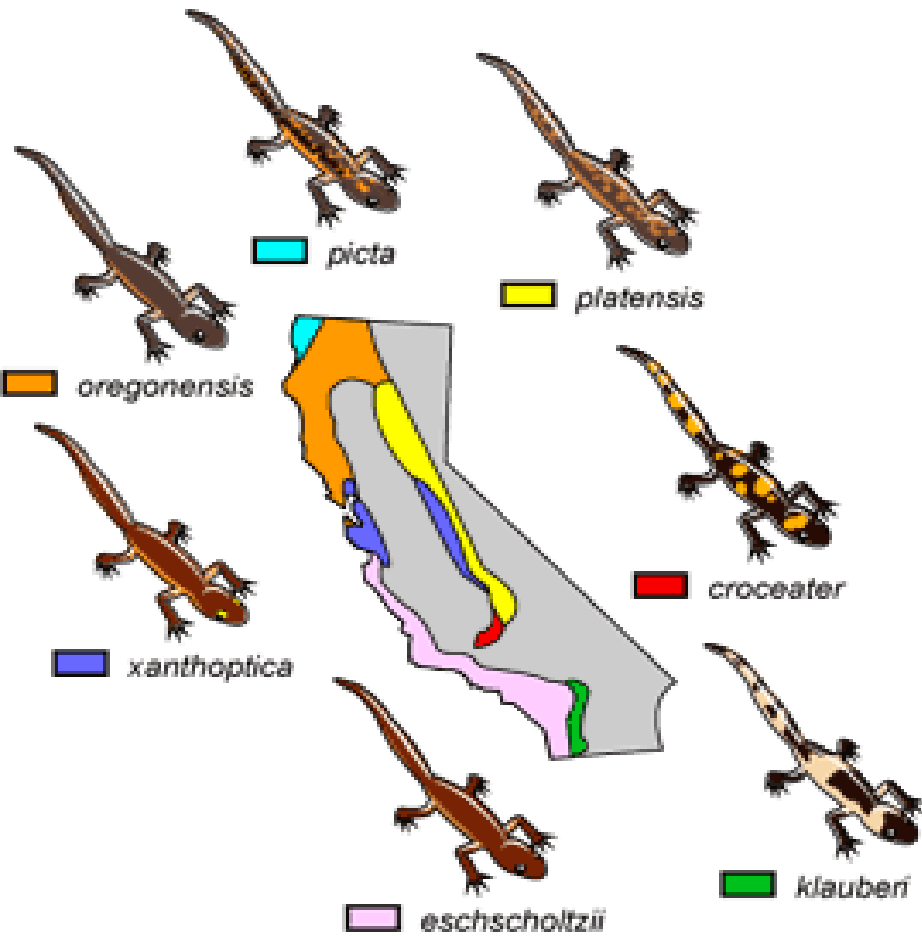


During Divergent Evolution – Different pressures in the environment selected different traits via natural selection and other drivers of evolution



All the species above are from a lineage of **MARSUPIALS. They all share the trait of developing young from a yolk-sac to a limited point then giving birth to a fetus that must crawl up to a marsupium (pouch) to finish off its development. This is very different than **PLACENTAL** Mammals. There are quite a few different species of Marsupials, could they have diverged from a common Marsupial ancestor?**

Often as one population of a particular species gets isolated from the rest of it's main population, it no longer has the ability to reproduce and blend it's genes with the main gene pool. After time, it own isolated gene pool undergoes isolated mutations and pressures from natural selection etc that make that group different from the main group. Sometimes the differences becomes such that even if that population is brought back into the main population, the may either choose not to mate with one another, or may be unable to produce fertile offspring with one another. **SPECIATION** occurs.



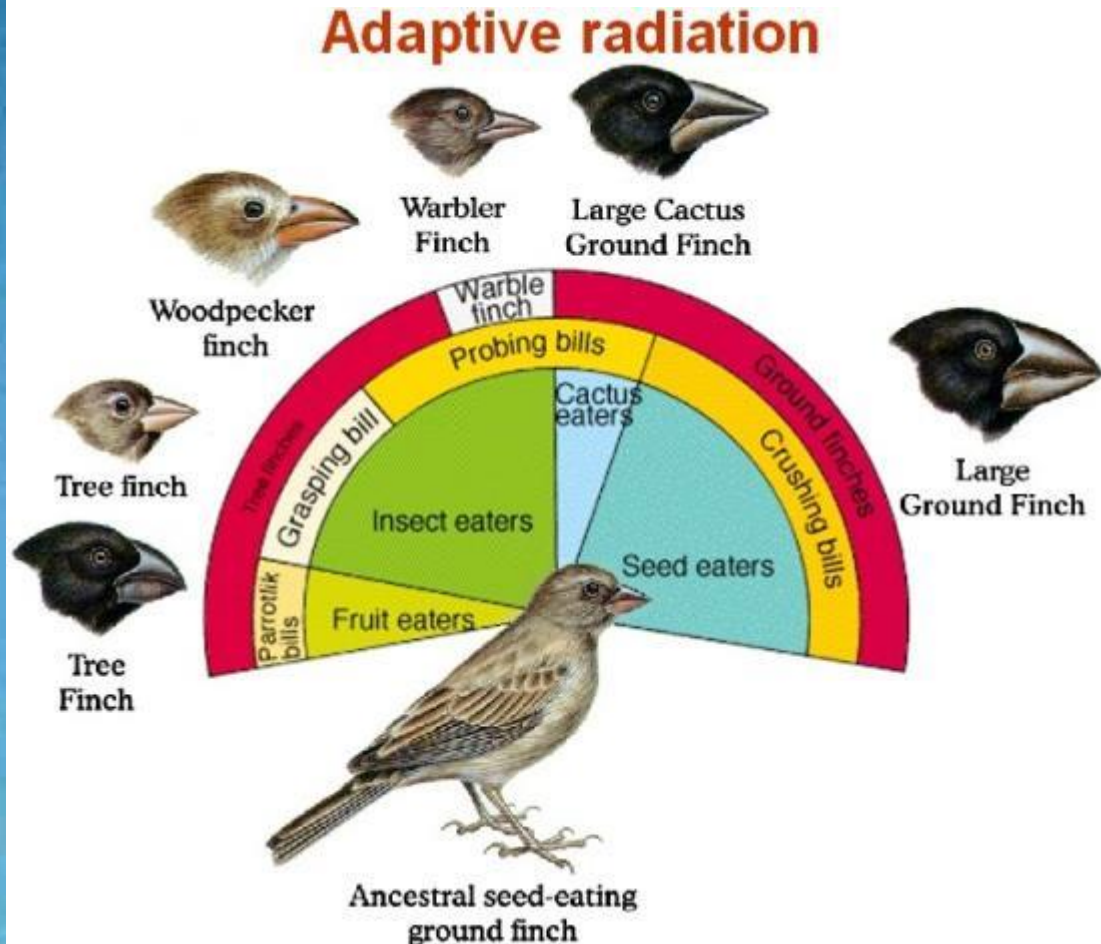
AFRICAN



ASIAN

ADAPTIVE RADIATION

- In some circumstances, many separate groups will break off from the main population to form their own isolated gene pools. These individual gene pools will undergo their own changes due to Genetic Drift, Mutation and Natural Selection etc. During these circumstances, many new species may form from one Parental Species. This is known as **“ADAPTIVE RADIATION”**



EXAMPLES of Divergent Evolution

Divergent evolution

Divergent evolution is the process in which interbreeding species diverged into two or more evolutionary groups.

COMMON ANCESTOR



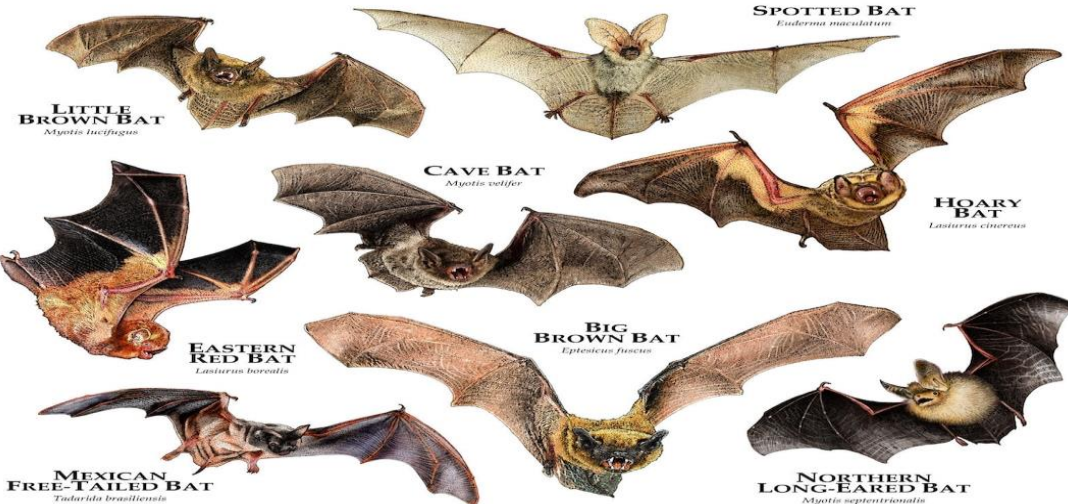
MAMMOTH

MAMMOTHS AND ELEPHANTS DIVERGED FROM A COMMON ANCESTOR (*Primelephas* sp.) SOME 4-6 MILLION YEARS AGO



ELEPHANT

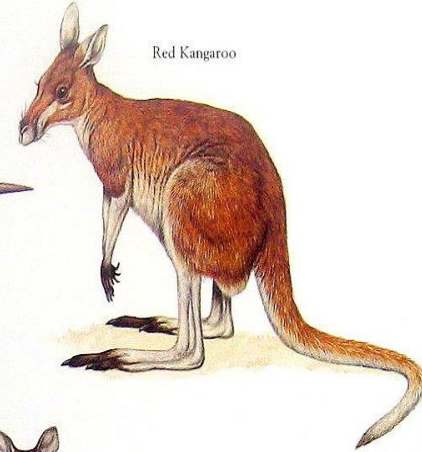
COMMON NORTH AMERICAN BATS



Quokka



Red Kangaroo



Lumholtz's Tree Kangaroo



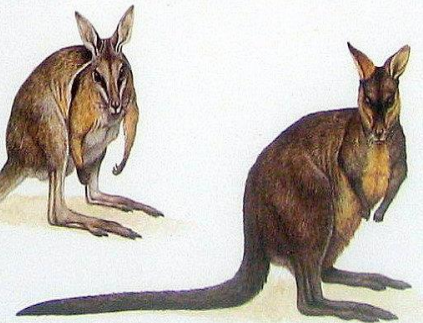
New Guinea Forest Wallaby



Bridled Nail-tailed Wallaby



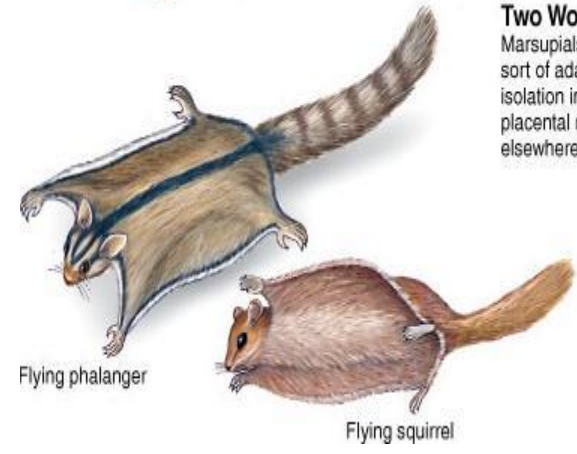
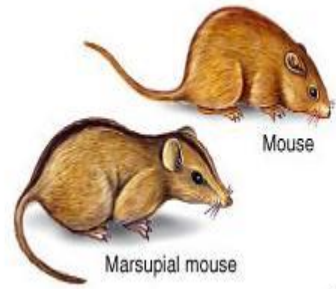
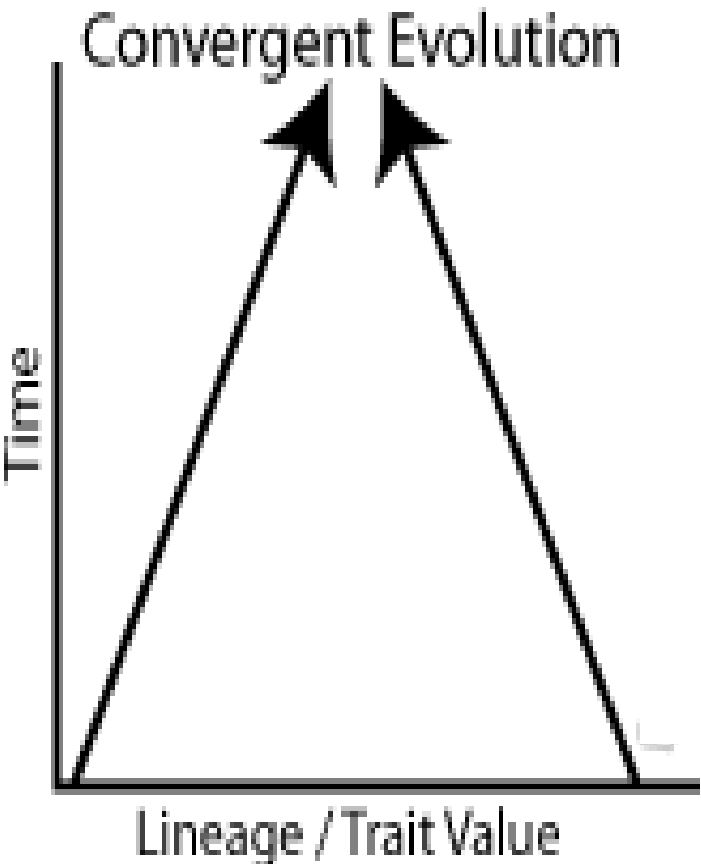
Swamp Wallaby



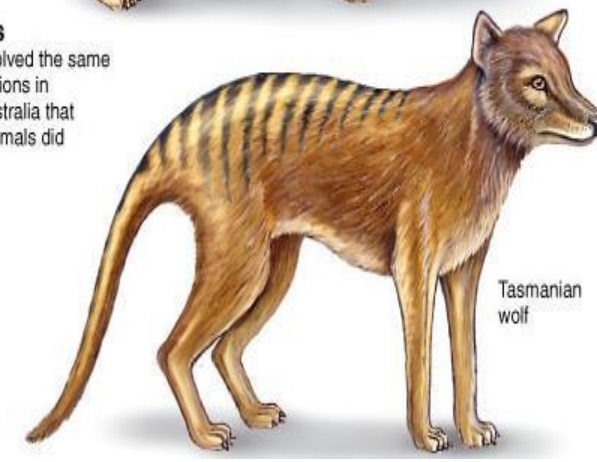
CONVERGENT EVOLUTION

To Converge means to bring together. Think of other words that use the same root word. "Congregate, Concert, Connect"

Could two or more different species that look similar and have similar traits, be totally unrelated to one another? But Drivers of Evolution selected similar traits for survival.



Two Worlds
Marsupials evolved the same sort of adaptations in isolation in Australia that placental mammals did elsewhere.

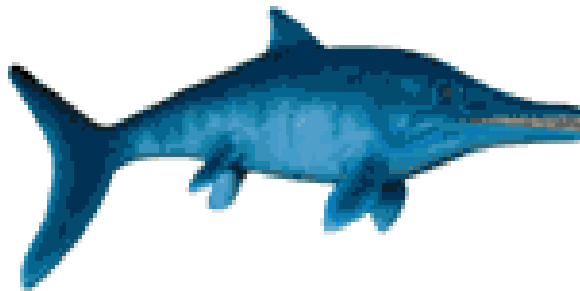


In this case, completely unrelated species have undergone evolution. The forces of Evolution (mostly natural selection) have selected out the most favoured traits for survival in that specific environment.

shark

ichthyosaur

dolphin



fish

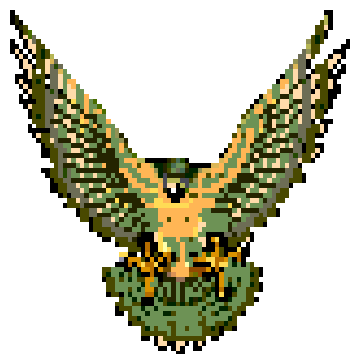
reptile

mammal

Whether the species is a mammal, fish or dinosaur, having similar body shape, fin positioning, and colouration was advantageous to all three species.

During Convergent Evolution Analogous Structures are commonly seen

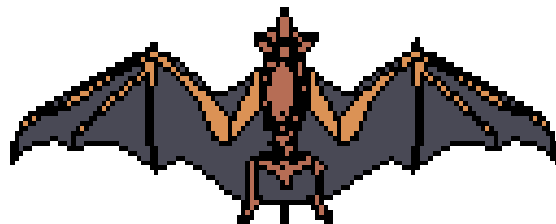
ANALOGOUS structures are structures that have very different genetic origin, but they have very similar function. Example Wings are a great structural adaptation, regardless of whether you are a bird, mammal, insect or dinosaur.



Falcon



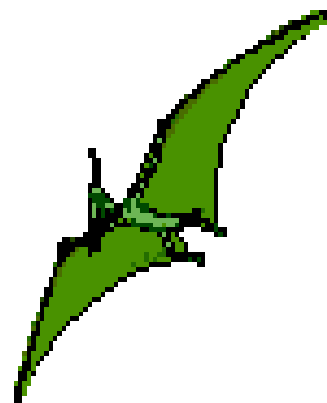
Ancestral
bird



Bat



Ancestral
mammal



Pterodactyl



Ancestral
reptile



Ancestral
Insect

WHAT TYPE OF EVOLUTION is shown here ?

Placentals



Flying squirrel
(*Glaucomys*)



Ground hog
(*Marmota*)



Anteater
(*Myrmecophaga*)



Mole
(*Talpa*)



Mouse
(*Mus*)

Marsupials



Flying phalanger
(*Petaurus*)



Wombat
(*Phascolomys*)



Anteater
(*Myrmecobius*)

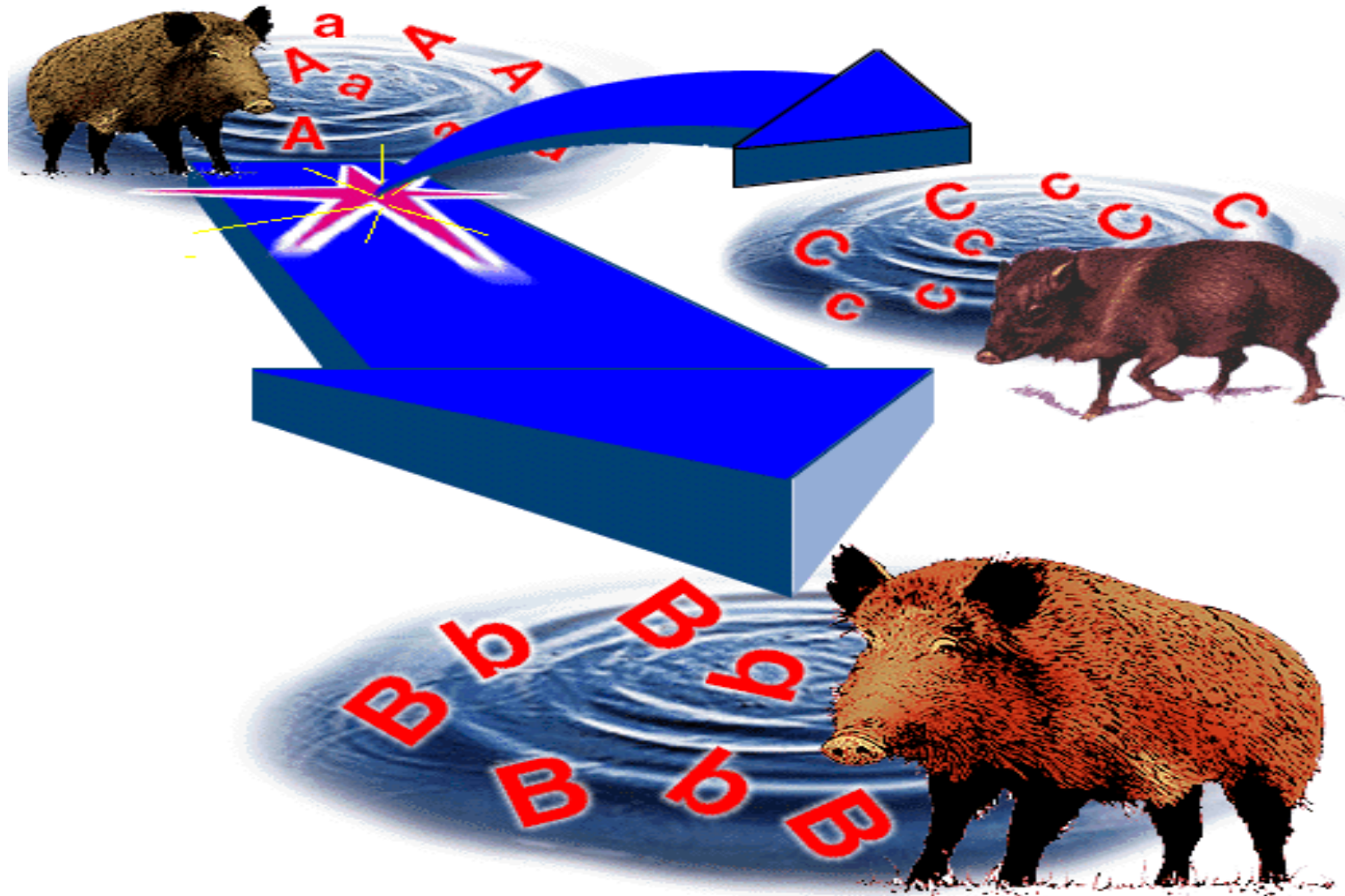


Mole
(*Notoryctes*)



Mouse
(*Dasyiscurus*)

What About This Example?



What is the Proper Name for the type of Divergent Evolution – Where many species come from one?

