

THEORY of CONTINENTAL DRIFT

Alfred Wegener proposed that all the continents on the Earth were together forming a super-continent called 'PANGAEA'.

The theory of CONTINENTAL DRIFT suggests that this massive continent broke apart and the continents drifted to their present positions.

The evidence to support this theory included:

- Glossopteris fossils
- Glacial deposits
- Folded mountains
- Coal deposits

THEORY of PLATE TECTONICS

Volcano and Earthquake activity and inactivity around the world, ocean floor spreading and moving into trenches near the edges of continents helped scientists to develop the theory of PLATE TECTONICS.

This theory suggests that the lithosphere is broken up into large chunks called plates. These plates are being moved by the magma convection currents in the mantle.

Where plates meet (converging boundary), separate (diverging boundary) or slide past each other (transform) certain geological events occur which create or destroy land.

MOUNTAIN BUILDING

A mountain is a part of the Earth's surface that is higher than the land around it.

A mountain range (cordillera) is a series of connected mountains.

Mountains are formed as a result of the interactions between, and forces created by, tectonic plates.

Most mountains are formed by a combination of folding and faulting.

FOLDING and FAULTING

Folding
syncline (downfold)



anticline (upfold) ↑

Faulting – when a tectonic plate cracks, movement on either side of the crack can occur.

Thrust Fault mountains are formed when one plate is forced up and over another plate.

Fault Block mountains are formed when plates stretch and tilt, allowing older rock to be placed above younger rock.

FOSSILS

FOSSILS are traces, or evidence of living things from the past preserved in sedimentary rocks.

Fossils are formed as a result of being buried by layers of sediment over a long period of time.

Petrification occurs when water penetrates bones dissolving the calcium carbonate leaving only silica.

Residue forming the outline of the organism preserved in rock is called carbonaceous film

FOSSILS

Original remains can be preserved intact, if the original organism is found in peat bogs, tar or amber.

Trace fossils are evidence of animal activity (footprints, burrows, trails), not actual remains.

Fossils can be formed by the mould or cast process. MOULD is the depression the animal or plant makes and the CAST is what fills in the depression.

Index fossils help to indicate the relative age of the rock the plant or animal is discovered in.

LOCATING FOSSILS

The relative age of different layers of rock is inferred by geologists using the PRINCIPLE of SUPERPOSITION.

ROCK STRATA are formations outlined in layers with the most recent (youngest) on top.

GEOLOGICAL COLUMNS help paleontologists infer the age of the fossils they find.

FOSSIL BEDS

Fossil beds are locations where many fossils are found.

BURGESS SHALE Fossil Beds have rich desposits of soft bodied organisms.

BADLANDS of DRUMHELLER have rich desposits of dinosaur bones.

Many of these fossil remains and replica recreations can be found in the Royal Tyrell Museum of Palentology in Drumheller, Alberta.

GEOLOGICAL TIME SCALE

Time periods called ERAS, based on sequence of rock strata and fossil identification, help scientists organize and represent the history of the Earth.

PRECAMBRIAN (formation of Earth, simple organisms)

PALEOZOIC (reptiles, amphibians, insects, land plants, fish with jaws)

MESOZOIC (dinosaurs, flowering plants, birds and mammals)

CENOZOIC (modern species, mammals advance, grasses, humans)