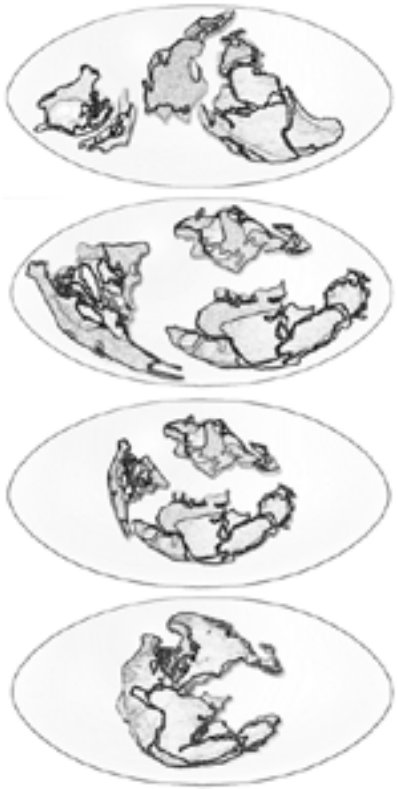
Section 6

CHANGE FORCES EVOLUTION !

Moving Mountains.



The idea of slowly shifting continents is not new, the earliest books on the subject date back to 1658. However it was in the twentieth century when geologists, (people who study rocks) began to understand Continental Drift theory, this was due mainly to the work of Alfred Wegner. The theory suggests a time when all the continents formed one huge land mass called **Pangea**. The idea says that temperature change within the earth generates massive pressure that forces the land apart.

In the 1950's an astonishing world pattern of underwater ridges, trenches and faults was discovered. The ridges were relatively hot while the trenches relatively cold. Their pattern was seen to match those generated by earthquakes and volcanoes and from this, the theory of plate tectonics was born.

Scientists believe that the earth's crust is like a rigid shell which is divided into pieces or plates, up to 100kms thick. Some plates have continents sitting on top of them, e.g. African Plate. Earthquakes and volcanoes mark the edges of the plates which are zones of weakness.

Movement in the plates can be observed at the edges because when 2 plates move towards each other, or converge, the lighter plate is always pushed down by the heavier plate. The lighter edge sinks down into the mantle, it melts and then pushes it's way back up into the crust again or even forms a volcano. When 2 plates tear apart or diverge, cracks are observed on the surface, the edges of the crack begin to heat and curl upwards forming ridges. Molten magma fills in the gaps from below.

The shape of today's continents and their geology gives an insight into the story of continental drift. Landmasses now separated by thousands of miles and oceans were once stuck firmly together. We can fit together the pieces and match their geology. We can trace our countries movements as they are pushed and pulled around the earth's surface at the speed of your growing fingernail. It's like a giant global jig-saw that has taken over 500 million years to pull apart!

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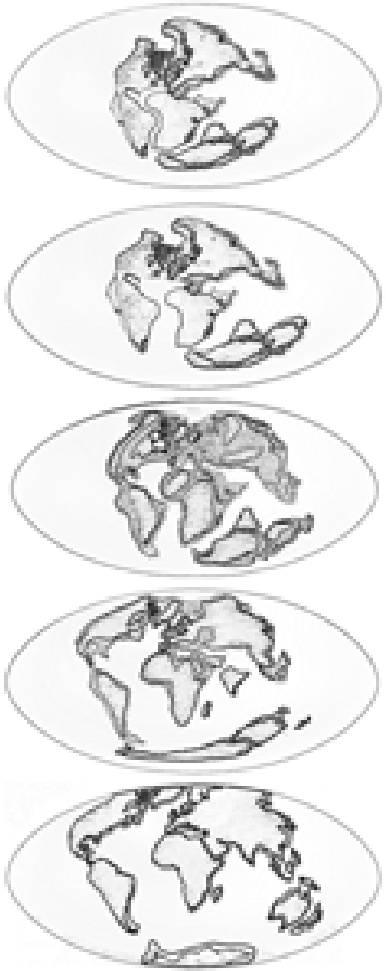
Drifting slowly northwards, the changing climate has a marked effect on the environment. Cooling from what was once a southern,tropical habitat with exotic animals and heat loving dinosaurs, we slowly enter the regions and time of the ice. Life forms not able to adapt must die. Climate change and natural disasters - the mother and father of extinction (death).

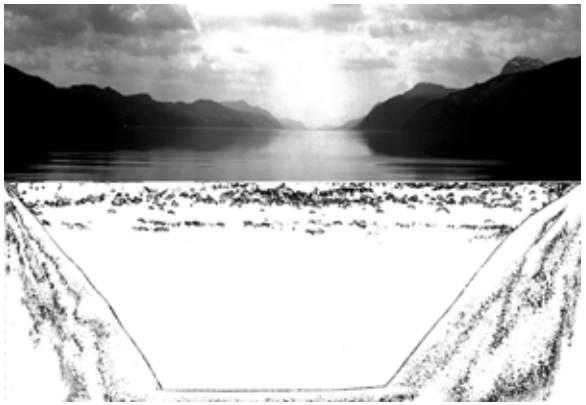
By digging into Britain's history, we unearth the bones of animals totally unsuited to today's climate. It is true that our climate has changed but it is also true that we have moved.

The "United Kingdom"
Scotland, once part of North America, though separated from England by an ocean was on a collision course. When the slow-motion crunch came, it folded and thrust up the hills to make the Caledonian mountain chain. Time and climate eroded the mountains down to today's more modest peaks **(erosion see glossary**). Scotland and England, now literally a "United Kingdom", began a journey from south of the equator to the much colder north and our present position.



Into the Trench…

The Great Glen **faultline** was torn across the Highlands over 300 million years ago. Just 10,000 years ago the last Ice-Age **glaciers** finished scouring out the loose and shattered rock in the glen and left behind an awesome canyon. This great rift holding more water than all the lakes and reservoirs of England and Wales put together - is Loch Ness.



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change or die!

You are now a GLOBAL EXPERT so only tick the right answers

1)

What do we mean by Scotland's Journey?

Is it a) Scotland's move to Independence .

b) The movement of Scotland as a land mass due to continental drift.

c) Scottish fans trip to see the World Cup.

2)

Climates vary as we move around the globe - we can fly around the world almost in an instant compared to continental drift! How do modern humans survive drastic and rapid environmental changes?

Answer yes or no to stay alive!

Do we	a) "Moult" in hot climates	YES	NO
	b) Grow more "hair" in cold climates	YES	NO
	c) Try new foods.	YES	NO
	d) Eat only what we have eaten before	YES	NO
	e) Change our types of house	YES	NO
	f) Change our breeding season	YES	NO
	g) Learn to hibernate	YES	NO
	h) Live in, or form groups	YES	NO

3) Use the Glossary if you are unsure what some words mean.

What sort of a climate would encourage a Fish to become an Amphibian?

Warm Cold Dry Humid (Circle your answers)

What sort of a climate would encourage an Amphibian to evolve into a Reptile?

Warm Cold Dry Humid (Circle your answers)

What sort of a climate would encourage a Reptile to evolve into a Mammal?

Warm Cold Dry Humid (Circle your answers)

4)

Imagine the temperature where you live has drastically risen (or fallen) during your own life time.

Describe how it is affecting you right now - is it wetter or dryer, hotter or colder. Has the country changed, has your house changed, have your clothes changed, your diet, transport? Is it going to affect your working life and your leisure time. Are you adapting to the changes physically? What do you miss most from the old days and will it be better or worse for your children?

5)

Monster Warning!

Using an atlas find Loch Ness and notice the lochs, locks and outlets to the sea between Inverness and Fort William.

When you have done this, think about the environmental hazards or obstacles that large creatures would have to overcome to get into and live in Loch Ness.

Finish by writing a message to the Loch Ness Monster warning of the hazards!

WRITE YOUR ANSWERS TO Q 4 AND 5 ON A SEPARATE SHEET

CLICK TO SEE NEXT SECTION