

2015 Q 1 .C

Examine the influence of tectonic activity on the development of the Irish landscape.

Due to the processes of convection currents and compression in the caledonian folding occurred about 450 million years ago in Ireland forming fold mountains. Convection currents are due to superheated magma (5000 degrees Celsius) rising from the earth's core until it hits the lithosphere, where it is forced to spread out horizontally, plates are forced to move with the magma, and in case of fold mountains, plates collide. The cycle continues as the now cooled magma sinks back to the core to push hotter magma up to the asthenosphere again. The American and Eurasian plates collided due to semi molten magma convection currents in the caledonian folding. The pressure during these foldings came from the South-East and North-West causing the mountain ranges tend to run a South-Westerly to North-Westerly direction. An example of these mountains are the Wicklow mountains with the highest point of 925 metres called Lugnaquilla. When these mountains were formed they were as high as present day Alps. However, due to weathering and erosion, they have been worn down and a granite batholith was exposed at the surface. This is the Leinster batholith, the largest batholith in Western Europe, that covers 120 kilometres squared.

The Armorican folding happened about 250 million years ago, when African and Eurasian collided due to convection current and tremendous pressure caused layers of rocks being buckled into huge folds. The Armorican mountain ranges run in an East-West alignment in the province of Munster with the highest peak of 1039 metres called Carrauntoohil. During the time of the folding Ireland lay 30 degrees south of the equator under a tropical sea. During this time, horizontal layers of limestone were laid upon sandstone. The collision caused compression from the South and North that crumpled the sandstone and limestone into great folds together. Ireland was further from the point of collision than during the caledonian folding, so the mountains formed during this folding were much smaller. An example of anticlines in the Armorican folding are the Comeragh mountains. An example of synclines is the Black Water valley which the River Lee runs through. The

limestone developed large splits where it was stretched over limestone. Rainwater entered the splits and the limestone was chemically weathered away by carbonic rain. the underlying limestone therefore became exposed on the ridges. The limestone in the valleys were more compressed and did not contain any splits, it was therefore not as easily weathered.