

Tectonic Movement – Plates and Faults

The tectonic movement of the Earth's plates has resulted in the folding and faulting of the Earth's crust. This is caused by the Earth's plates converging, diverging or transversing against one another. This causes the crust of the Earth to buckle and strain, generating incredible amounts of pressure that build up as time progresses and may conclude in the release of this energy. The crust is divided into layers of materials that have been compressed together. These layers are known as strata, laid down and composed of the denudated material of pre-existing rocks. Folding and faulting are the result of tectonic activity, but also the forces of tension, compression and shearing play an active role in plate movements. An example of a landform created because of the effects of folding include Fold Mountains, such as the Himalayas, while a Rift Valley, such as the East African Rift Valley, is formed from a fault.

In folding, the Earth's crust is pulled and strained, resulting in a variety of different features that can be commonly seen when examining a cliff face. There are three parts of a fold: the anticline (high), the syncline (low) and the limbs, commonly referred to as the "arms" of the folds. Folds can be divided into several different types, such as a monocline, whereby the layers travel in the same direction, a symmetrical fold, both arms have the same slope, a asymmetrical fold, the slope of one arm is steeper than the other, and a overfold, whereby the arms have slightly overturned.

Fold mountains are the grand designs of folding and the mountains of today's world date back to almost 450 million years ago, which are the Caledonian folding's. The converging of the North American and the Eurasian plate resulted in an intense folding period lasting about 50 years. Dublin/Wicklow Mountains are an example of such folds. The most dominant foldings that affected Munster are the Armorican folding's, which shaped much of the region. About 270 million years ago, the Eurasian and African plates collided, resulting in the buckling of the crust. Munster at this time was filled with anticline hills and syncline valleys, which were filled with layers of sandstone, shale and limestone and were compressed due to the strain. Over the millions of years, ranges such as the Caha Mountains and the Comeragh's came to be. The buckling also resulted in the raising of a limestone bed, which now resides in the midlands of Ireland as is known as the Burren.

Faulting is a process that occurs due to the intense strain on plates that is endured by the folding of layers. The pressure of compression or tension results in a fracture to occur in the fold, which can form along a fault line. Movement along this fault may be horizontal or vertical. Such an example of a fault line is the San Andreas Fault Line in America.

There are three main types of faulting: normal faulting, reverse faulting and tear faulting. They occur due to divergence, convergence and transverse movement of plates respectively. Rift valleys are found between two parallel normal faults on a part of land known as a graben, a sunken part of the land so to speak. This occurs because the foothold block is upthrown while the hanging block is downthrown. These are surrounded by block-mountains, also known as horsts which move apart and increase the size of the valley. Rift valleys are distinguishable by the sharp, declining sides. In conclusion, the movement of the Earth's plates results in the folding and faulting of the Earth's surface due to processes such as compression, tension and shearing, and in doing so, deform and rearrange the Earth's crust.