

Formation of Waterfalls | Sample answer

2017 Q3.B

Examine the impact of the processes of erosion on the formation of one fluvial landform

A fluvial landform of erosion is a waterfall. A waterfall is a vertical drip in the youthful stage of a river over which a river falls, usually where a band of soft rock e.g limestone lies downstream from a band of hard rock e.g granite. The process of hydraulic action is very active in forming a waterfall. This is the sheer force of the moving water against the land. It begins as rapids on the river floor which erodes the river's banks and bed to give rise to the vertical descent of the river's course. As the river erodes vertically it erodes the soft rock much quicker than the harder rock which leads to differential erosion. The water in the youthful stage is very fast flowing due to the steeper gradient which then allows the water to carry rocks. This makes the process of abrasion active, as the moving rocks scrape and smooth the river channel. This leads to the increase in the depth of the rapids and the erosive power of hydraulic action. As differential erosion continues, a small waterfall may be formed and seen within the river. The falling water then erodes a deep hole called a plunge pool at the base of the river, as the water is fast flowing and erosive because it is not hindered by friction. The river's load is worn down itself within the plunge pool due to the process of attrition, as the river's load hits of each other, the riverbed and the back wall. The water and its load undercut the back wall of the plunge pool, so that eventually the overhanging rock collapses. Collapses may occur again and again as the river continues to erode the back wall, in a process called headward erosion. The position of the waterfall will retreat gradually upstream. The narrow valley that is left from the retreating position of the waterfall is called a gorge. If headward erosion happened quickly sometimes a steep-sided gorge will be formed as mass movement has not had time to occur and widen it. The Niagara falls on the US/Canadian border has a gorge of eleven kilometres long and migrates back at a rate of one metre a year. An Irish example of a waterfall is Torc waterfall, Killarney, Co.Kerry.