

With reference to the Irish landscape, examine the processes which have influenced the development of any one underground landform in a karst region.

(30 marks)

Limestone is chemically weathered by a process of carbonation. As rainwater absorbs carbon dioxide as it passes through the atmosphere it becomes a weak carbonic acid. The water and carbon dioxide combine to form a weak carbonic acid. This weak carbonic acid acts on the fissures in the limestone. Carbonic acid reacts with the Calcium Carbonate in the limestone, which is then carried away in solution as Calcium Bicarbonate after chemical weathering has taken place. Rainwater, which annually exceeds 1200mm in the Burren uplands, seeps downwards through the limestones joints and bedding planes. As it seeps, it seeks out weaknesses in the heavily jointed and permeable (pervious) limestone bedrock.

The one feature I will discuss is Speleothems or Dripstone Features (Marble Arch Caves in Co. Fermanagh). These features form in caverns that are partially dry due to the lowering of the water table by a stream or tectonic uplift. Pure calcium carbonate, or calcite, is transported through the joints and bedding planes as solution (as discussed above) and seeps through the roof of a cave through fissures. As the drops of water come into contact with warmer air in caves/caverns they leave a speck of calcite behind as they evaporate. As the calcite hardens and continues to grow, icicle-shaped dripstone features form, called Stalactites. They initially grow as straw stalactites but blockage of the passage in the straw results in the formation of a solid stalactite. Where the majority of the percolating water collects on the floor, mounds of calcite are created and gradually grow upwards, creating Stalagmites (which can also be called flow-stones). When stalactites and stalagmites grow together they form Pillars/ Columns. If the process occurs along a crack in the ceiling, it builds a vertical curtain-like sheet of calcite that hangs from the cavern roof.

All of the details above are categorized within the one feature called speleothems/ dripstone features.