Geology Sheet 15

Cliff erosion; how the mighty are fallen.

Many of the cliffs and terraces in the Burren limestones have loose blocks or boulders at their bases (Fig. 1). This is because the joints that permeate the Burren and those near the cliff edges in particular are affected by freeze-thaw action. Water percolating into the joint would freeze during winter and expand, placing pressure on the rock outside the joint (Fig. 2A, B). Repeated freezing and thawing during severe cold spells would weaken the rock and expand the joint to the point that it would eventually fail, and the rock outside the joint fall (Fig. 2C).

Fig. 1. Loose boulders at the base of a cliff on Mullaghmore.

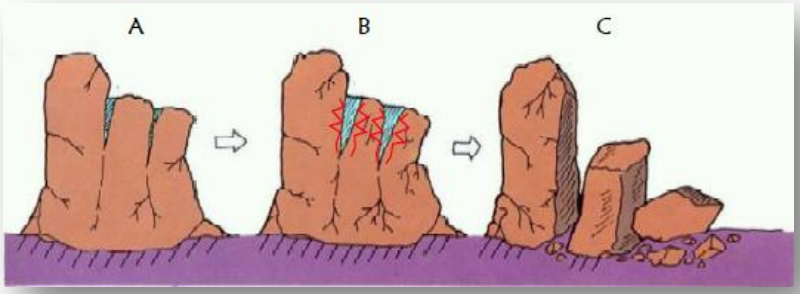

Fig. 2. Break-up of rocks by freeze-thaw action.

The joints that permeate the limestone also have a significant role in coastal erosion. Waves are forced into the narrow joints and the air trapped inside can be subjected to a hydraulic pressure which compresses the air in cracks of the rocks. This exerts pressure on the surrounding rock which can progressively crack, break, splinter and detach rock particles. Eventually, as more joints are expanded, large blocks of rock weighing many tons can be moved during big storms.

Fig. 3. Large storms can generate huge hydraulic power along the coast.