

weak soil shows but reservoir quality was significantly poorer than at Wytch Farm.

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Landscape and Geology of the Burren: Co Clare Ireland By Isabel Buckingham

I first went to the dramatic landscape of the Burren as a student in 1968, and have returned several times. There was little change when I visited in 1973, but dramatic differences when I visited in May 2018. A great deal of information is found at <http://www.burrengeopark.ie/>. The Irish know how to market geology with walks, information boards and a Centre. To the south east and abutting, is the Burren National Park, just under 2,000 hectares, bought by the Government before they ran out of money and run on traditional lines. More information can be found at <http://www.burrengeopark.ie/>.

A Cromwellian Officer described the country “as not enough water to drown a man, wood to hang one, nor earth enough to bury them. This last is so scarce that the inhabitants steal it from one another yet their cattle are very fat. The grass grows in tufts of earth two or three foot square that lies beneath the limestone rocks and is very nourishing”. It is a fairly apt summary.



Image 1: Dryas octopetala usually a Boreal plant—Part of the May flower extravaganza in the Burren

The Carboniferous Limestone dips very gently to the south east, never more than 5 degrees, but often less. This area is a long way from the Variscan Front. A layer of the impervious Clare shales is found above the limestone, and on some hill tops the Gronagort sandstones form the summit area. This area has been glaciated several times, has Galway granite erratics and also from the most recent glaciation, the ice sweeping round from the north and heading west to the sea. Some of the higher ground may have been ice free during the last glaciation and the terminal moraine can be seen in the Shannon Estuary. There is a clearly marked alignment to striations and glacial deposits.

Traditional Karst scenery is better developed than in England, because of the large area and depth of Carboniferous Limestone and also the very gentle dip. One unusual feature is the Turloughs. These seasonally

fill up with water in winter and drain away in the summer when rainfall is less. Some have peat development but the lush summer grazing is important in the cattle rearing economy. The largest is at Carran being 4.5km². After prolonged or heavy rain the Polje fills up to form the turlough, but when less wet the Castletown river flows over the surface before going underground.



Image 2: Folded limestone on Mullaghmore Burren National Park



Image 3: Edge of a turlough in May. Water was rapidly drying, but warm and I'd never seen so many tadpoles. A thin film of silt covered the hard rock.

Caves range from the very recent and superficial at the present shale/limestone boundary to well-developed systems with several levels, some under sea-level. Many are wet and prone to flooding.



Image 4: View from Mullaghmore to Lough Gealain

There are marked surface valleys in the limestone.

What you immediately see however is the limestone pavement, and in May the spectacular unique flora. What is not appreciated is that the limestone pavement has developed under a soil cover. The high CO₂ level in soil air facilitates the chemical erosion. In the Burren this soil cover was removed about 2,500 BC when the Beaker people cleared the wooded cover. Residual soil has been dated from the base of the grykes.

There is the strange sight of stone walls dividing fields that seem to consist just of limestone pavement. Mound walls are 30-80 cms high and 80 to 100 cms across. They date from the early Bronze Age 2,500 to 1,500 BC, rest on bedrock and seem associated with the Beaker People. The fields were small and irregular and aligned NW/SE. Slab Walls made from upended slabs of limestone predate the parish system but are more recent than the tumble walls. These are linear, made of stone and standing one or two courses high. They are associated with the ring and stone forts that date 400AD to C17th. Early Christian sites are often associated with a precious spring where a clay band in the limestone brings water to the surface.

Cattle traditionally are grazed on the hills in winter. There are no frosts, and in summer they are moved to the low ground to graze land that is flooded in winter. The desperate search for feed in winter means any tree shoots are nibbled down. No sheep have been kept here since about 1950.



Image 5: View from Mullaghmore of bare limestone inside the national park

The general population of Carron was >1,000 in 1841 before the potato famine. In 2011, that figure had dropped to 106 and is still falling. It is the intense traditional grazing that led to deforestation in the area and kept the limestone pavement visible. It is reckoned the amount of pavement was twice present levels in 1841.

The average annual rainfall is approximately 1163mm p.a. Once tree cover was removed erosion of the thin soil, developed on glacial deposits, must have been rapid. So much slab limestone has been used in walls,

monuments and forts it is hard to find the expected sculptures limestone pavement. In places limestone boulder erratics are left on the surface when all the smaller particles have been removed. On Slieve Elva there are boulders of Galway granite from an earlier glaciation.

A decreased population and changed agricultural practise has resulted in much recent growth of hazel shrub on areas previously exposed limestone pavement. This is from either a lowering of grazing intensity, or using a bred of beef cattle not able to thrive in these conditions on the winterage. Lack of summer grazing means the flowers grow without being trampled. Steps are being taken with EU funding, to encourage traditional farming methods to maintain the pavement. The feral goats do not help. Not only do they follow each other and jump over the wall at the same place, necessitating future repair, but they graze the good valley land the farmer wants for his stock.



Image 6: Feral goats are a problem

The limestone pavement is the result of Bronze Age clearance and a very particular agricultural regime. The unique flora is a mix of Ice Age remnants, woodland floor and southern European. This area now depends on the visitors, so do visit.

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My Top 5 Geological Sites of Pembrokeshire By Megan Taylor (Year 13 Wells Cathedral)

Pembrokeshire is a small, yet beautiful county located in Southwest Wales on the coast of the Irish Sea. The county is home to Pembrokeshire Coast National Park designated in 1952, which is the only coastal national park in the United Kingdom. The Pembrokeshire Coast National Park was also recently ranked the second best coastline in the world by the National Geographic magazine and thousands of tourists visit it every year to visit its stunning beaches, castles and seas. However, there is more to Pembrokeshire than beautiful scenery and high levels of biodiversity. It is also renowned for its spectacular geology with a wide range of lithologies from different geological time periods. Travelling from the south of the county to the north it is possible to travel back in time through cross millions of years of geological history from Devonian