

LEITRIM

AREA OF COUNTY: 1,588 square kilometres or 613 square miles

COUNTY TOWN: Carrick-on-Shannon

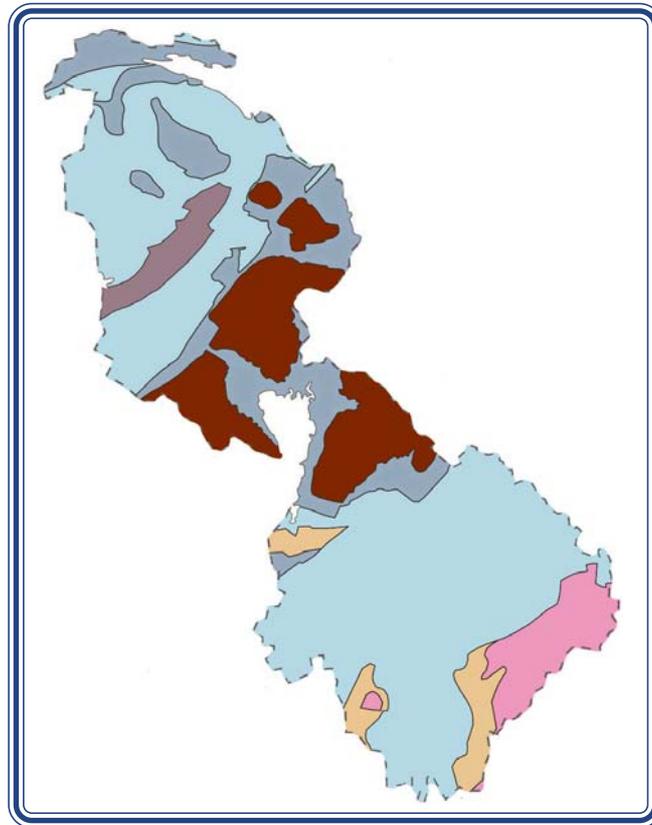
OTHER TOWNS: Ballinamore, Drumshambo, Dromahair, Manorhamilton

GEOLOGY HIGHLIGHTS: Carboniferous limestone cliffs, glacially deepened valleys, landslips, Precambrian gneiss, Arigna coalfield

AGE OF ROCKS: Precambrian, Devonian, Carboniferous, Paleogene, Pleistocene



Carboniferous limestone knolls at Doon Lough.



Geological Map of County Leitrim

Pale purple: Precambrian metamorphic rocks; **Pink:** Ordovician sediments; **Beige:** Silurian & Devonian sandstones and conglomerates; **Dark blue:** Lower Carboniferous sandstones; **Light blue:** Lower Carboniferous limestone; **Brown:** Upper Carboniferous shales.

Geological history

The landscape of much of County Leitrim is stunning and varied, with lakes and valleys nestling among flat-topped mountains. Only in the south-east of the county is the landscape more subdued.

The oldest rocks in the county occupy a narrow strip extending from a little north of Manorhamilton, south-westwards past the southern shore of Lough Gill and on to the Ox Mountains in adjacent Co. Sligo. These rocks are believed to have been deposited originally as sandstone, perhaps marine, rich in grains of the mineral feldspar. However, extreme heat and pressure at some time between 540 and 580 million years ago [Ma] metamorphosed these sandstones into a banded, high grade metamorphic rock called gneiss. The original age of the sandstone is difficult to be certain of but it is certainly Precambrian and at least 940 million years. These very ancient metamorphic rocks form the rounded hill of Benbo, just to the south-west of Manorhamilton.



Cliffs in Glencar Limestone (Lower Carboniferous), Swiss Valley

Younger, and less severely metamorphosed, Precambrian rocks, around 600 Ma, occupy a very small area immediately to the west of Manorhamilton. These rocks represent sand, limestone and muddy sand that accumulated on an ancient sea floor, but

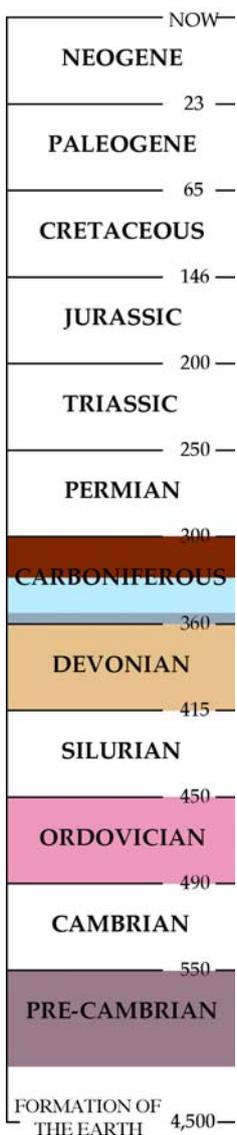
they were metamorphosed to quartzite, marble and schist by the heat and pressure generated as continental plates moved towards each other.

Immediately south of Drumshambo, in the south of the county, and extending westwards into Co. Sligo for some distance, is a thick sandstone

with thin mudstone beds that was deposited in large rivers. It is believed to be of Devonian age, between about 415 and 360 Ma, but no fossils have been found to verify this.

The great majority of the bedrock in Co. Leitrim is Carboniferous in age, between about 360 and 320 Ma. The oldest Carboniferous rocks are pebble beds and sandstones deposited by rivers but these were buried beneath a thick succession of marine limestones, mudstones and sandstones as sea level rose to spread across the flood plains. Limestones, often fossiliferous, formed in clear tropical seas when little sediment was being brought down by rivers. Some of these limestones accumulated as steep-sided 'mud mounds' on the sea floor while others are especially rich in layers of chert, an impure type of flint formed from sponge spicules. When the sediment supply was higher because of increased erosion on land, mudstones accumulated on the sea floor, while some of the sandstones represent deltas that formed at river mouths.

The arrangement of these different rock types within the landscape is one of the main causes of the diversity of the Leitrim landscape. Thick limestones, including 'mud mounds', lie above soft mudstones in the Glencar and Glenade valleys, creating the often sheer-walled appearance of these valleys as huge limestone blocks have slid downwards on the soft mudstone beneath. Elsewhere, as at Doon Lough, a remarkable



Geological timescale showing age of rocks in Leitrim.

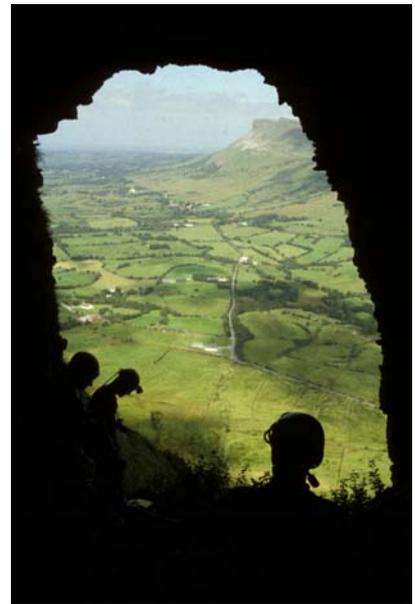
In 1997 a cave in the Glenade valley was found to contain the bones of several adult brown bears and many cubs. Carbon-dating has shown these to be less than 4000 years old

rolling limestone landscape has been created where erosion has stripped away the heavily fractured cherty limestones that blanket the more resistant 'mud mound' limestones. Large areas of mountain top in the north-west of the county have flat, plateau-like summits formed on the gently dipping limestones or the sandstones which cap them.

In general across the county the Carboniferous rocks dip gently to the south-east, so that the youngest rocks are found on the hills around Lough Allen. Above the main limestones, which underlie the low ground in the south-east of the county, are more mudstones and sandstones, with a few thin coal seams, forming the hills of Seltannasaggart, Slieve Anierin and Bencroy. These mudstones and sandstones were deposited largely on river deltas but at several levels there are thin black mudstone bands containing marine fossils. These 'marine bands' were deposited when sea level rose for a short time and temporarily drowned the deltas.

The youngest bedrock features in the county are around 60 Ma. They are igneous dykes, fissures cutting through older rocks and filled with solidified basalt lava en route to the surface. Two have been found on the large plateau between Lough Melvin and the Glenade valley with a third, approximately 900 metres long and 35 metres wide, about 3 km south-west of Dromahair.

As elsewhere across much of Ireland, the ice sheets and glaciers of the last Ice Age have substantially modified the Leitrim landscape. Some aspects of this glacial modification are very obvious; the steep-sided overdeepened valleys of Glencar and Glenade are fine examples of glacial U-shaped valleys. The giant landslips which have contributed to these valleys' distinctive topography are also due to the effect of glaciers, or rather the loss of support once the ice has melted thereby allowing huge blocks of limestone to slide downslope on the soft mudstones beneath. On a more subtle note much of the lowlands is blanketed with glacial till, or 'boulder clay'.



Map adapted with permission from Geological Survey of Ireland 1:1,000,000 map 2003.

Image credits: Mike Simms (all).