

MONAGHAN

AREA OF COUNTY: 1,294 square kilometres or 499 square miles

COUNTY TOWN: Monaghan

OTHER TOWNS: Carrickmacross, Castleblayney, Clones

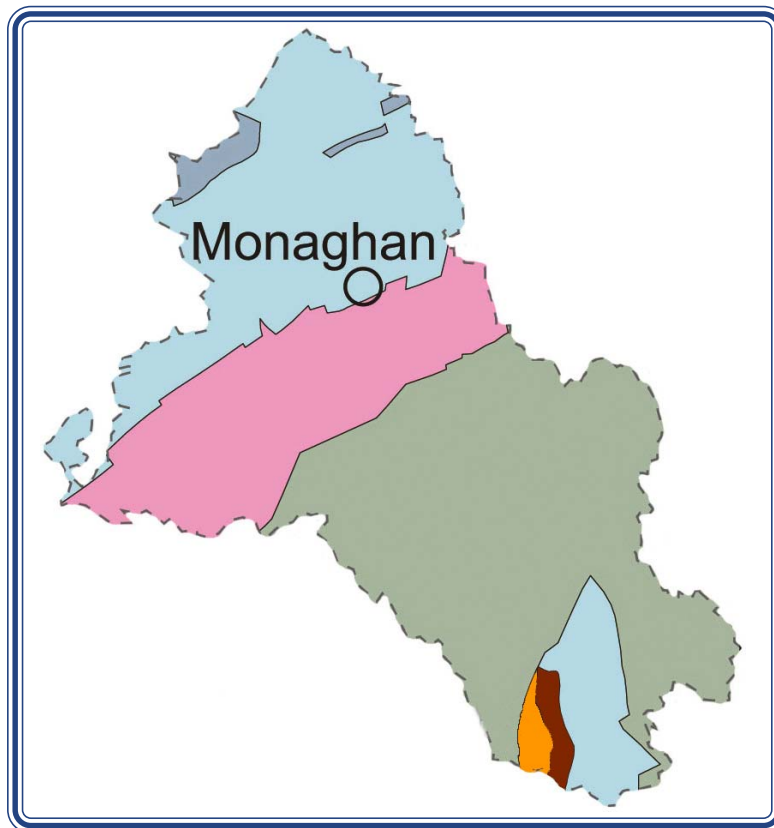
GEOLOGY HIGHLIGHTS: Gypsum deposits

AGE OF ROCKS: Ordovician, Silurian, Carboniferous, Permian, Triassic, Paleogene



Milltown Lake, Oram, near Castleblayney

This lake is nestling among rounded drumlins which are composed of sediments deposited as the ice of the Ice Age melted away.



Geological Map of County Monaghan

Pink: Ordovician sediments; **Green:** Ordovician & Silurian; **Dark blue:** Lower Carboniferous sandstones; **Light blue:** Lower Carboniferous limestone; **Brown:** Upper Carboniferous shales; **Orange:** Triassic sandstones.

Geological history

With the exception of the southern slopes of Slieve Beagh, in the extreme north-west of the county, the landscape of Monaghan is low and gently undulating. The oldest rocks form a strip from north-east to south-west across the centre of the county. These Ordovician rocks, around 460 to 445 million years old, consist mostly of mudstone and muddy sandstones, or 'greywackes', but include some submarine lavas. They accumulated on the floor of an ocean at a depth of more than 4000 metres. Similar dark mudstones and greywackes of Silurian age, around 445 to 440 million years old, again with some minor submarine volcanics, form a much broader band across much of the southern half of the county.

The northern third of the county is underlain by Carboniferous rocks, from around 360 to 330 million years old. They are very poorly exposed but boreholes show that the earlier rocks are pebble beds and sandstones,

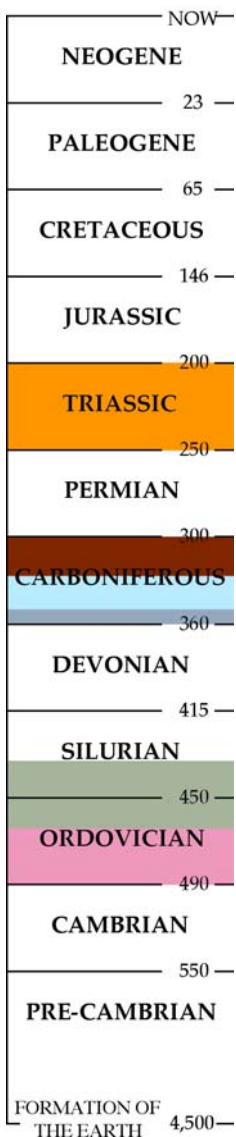
overlain by limestones and then by thick mudstones and sandstones on the south slopes of Slieve Beagh. The pebble beds at the base were deposited in broad shallow rivers which were gradually submerged, as sea level rose, by lagoons and then by shallow tropical seas represented by the limestones. The younger mudstones and sandstones above them were deposited by river deltas encroaching into the sea as sea level was falling again.

Carboniferous and younger rocks, surrounded by much older Silurian rocks, are found in the extreme south-east of the county where they have subsided along a major tectonic fault. Grey Carboniferous limestone, deposited on a shallow sea floor around 330 million years old, are overlain by younger Carboniferous sandstones and mudstones, with a few thin coal seams, deposited in an Equatorial swamp or delta environment around 320 million years ago.

Strikingly different rocks lie above, and to the west of, these Carboniferous rocks. Red mudstones with two gypsum beds up to 35 metres thick are Permian in age, around 255 million years old, while thick red siltstones and sandstones above them are Triassic, slightly less than 250 million years old. Both the Permian and Triassic rocks accumulated on a desert land surface, with gypsum being deposited as saline lakes dried out under the arid conditions.

The youngest rocks in the county lie above, and within, these Permian and Triassic 'red beds'. Basalt lavas lie above the Permian gypsum being quarried at Knocknacran while dykes and sills, the fissures up which the lava travelled to reach the surface, have been seen both in the opencast gypsum pit and in the underground mine. These lavas are almost certainly of Paleogene age, around 60 million years old, a time when much of north-eastern Ireland was wracked by volcanic activity.

The ice sheets that covered Co Monaghan during the last Ice Age have had a profound influence on its present landscape. Most of the low ground is thickly blanketed with glacial till, or 'boulder clay', obscuring the bedrock geology beneath. Over much of the county this was moulded by the moving ice sheet into the countless drumlins which give the landscape its 'basket-of-eggs' appearance.



Geological timescale showing age of rocks in Monaghan.

Monaghan fossils

The bedrock of Co. Monaghan is so extensively covered by glacial deposits that there are few opportunities to find fossils. Almost the only fossils found in the Ordovician and Silurian rocks are the pencil-marking like fossils of graptolites. The Carboniferous limestones contain typical fossils, such as corals and brachiopods, which may be found where these rocks are exposed.

Mining & Building Stones

Two quarries in the Silurian greywackes, one in the Carboniferous limestone and one in glacial sand and gravel extract material for use as road chippings and aggregate for the construction industry. There is a working brick pit at Losset and others, now disused, near Carrickmacross and Castleblayney.

Knocknacran Mine, a few kilometres south of Carrickmacross, has been worked both underground and opencast. It is Ireland's most important producer of gypsum and has long been a major source of plaster products for the construction industry.



Red Permian mudstone and gypsum, and grey rotted basalt, at the Knocknacran opencast mine.

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