

# LIMERICK

**AREA OF COUNTY:** 2,686 square kilometres or 1,037 square miles

**COUNTY TOWN:** Limerick

**OTHER TOWNS:** Askeaton, Kilmallock, Newcastlewest, Rathkeale

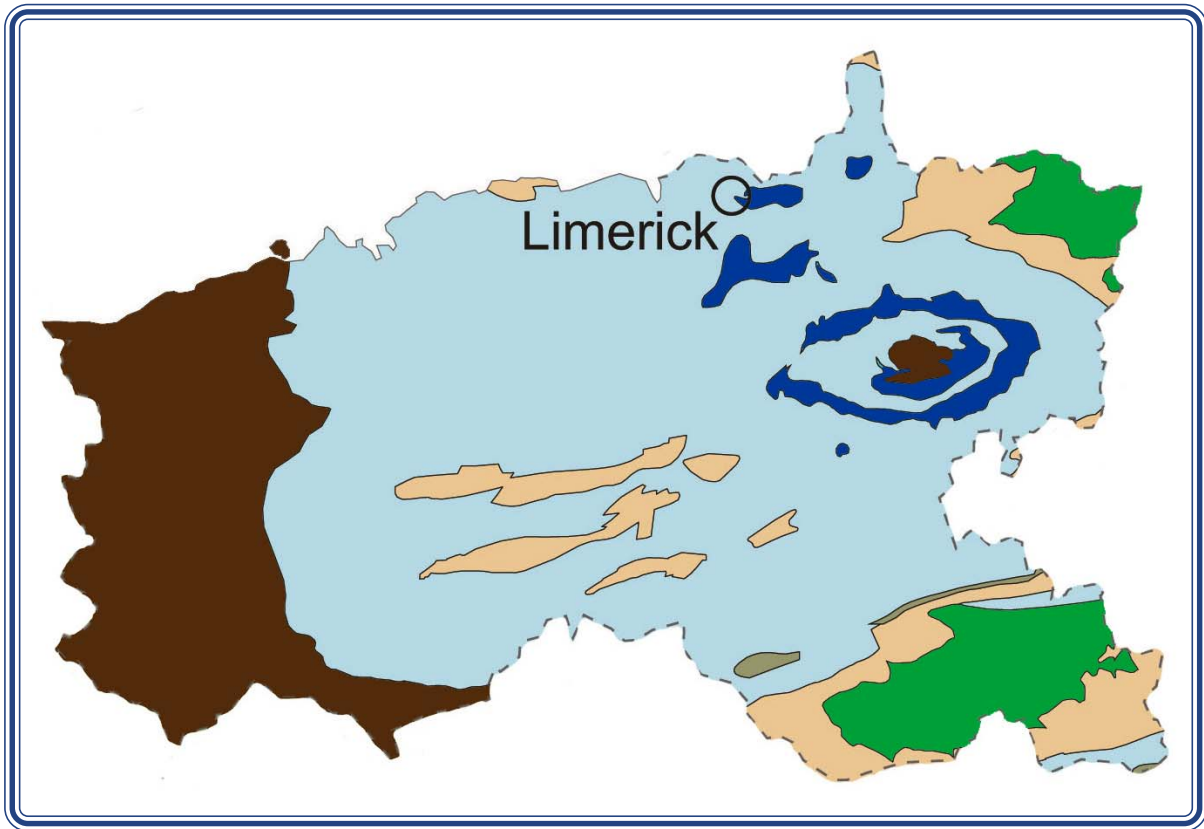
**GEOLOGY HIGHLIGHTS:** Giant Irish Deer, Lower Carboniferous limestones and volcanic rocks

**AGE OF ROCKS:** Silurian to Carboniferous



## **Carrigounnell Castle, Co. Limerick**

This ruined 13th to 16th century Norman castle is perched on top of a crag of Lower Carboniferous volcanic rocks



**Geological Map of County Limerick**

**Green:** Silurian sediments; **Beige:** Devonian sandstones and conglomerates; **Light blue:** Lower Carboniferous limestone; **Brown:** Upper Carboniferous shales; **Dark blue:** Carboniferous volcanic rocks.

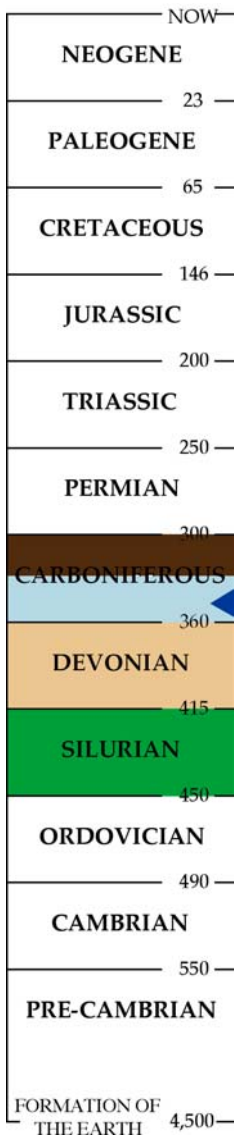
### **Geological history**

The geology of Co. Limerick comprises rocks that are between 450 and 300 million years old [Ma]. The Silurian rocks are the oldest and are mudstones and sandstones deposited in an ocean that separated Ireland into two. This ocean, at that time, had nearly closed as the continents on either side moved together. These oldest rocks now make up the Slievefelim Mountains. At the start of the Devonian period (415 Ma) the landscape had changed significantly. No longer was Ireland split into two, but it consisted of one large continent. The climate was dry and the land desert-like because of a lack of plants. It contained many sand dunes of wind-blown sand but also temporary rivers which occasionally flooded and as they did so coarse pebbly sediments and sands were deposited. These were eventually cemented to form conglomerate and sandstones which make up part of the Slievefelim range. The area became flooded by a shallow tropical ocean at the beginning of the Lower

**Giant Irish Deer (male) from Lough Gur now at Trinity College, Dublin**

Carboniferous (360 Ma). Life in the oceans was plentiful and is now seen as fossils in the pale grey limestone. Small mudmounds developed in the oceans. Today in the Pallas Green district can be found some volcanic lavas and other rocks surrounded by limestone. Some zinc was also found locally. In Ireland such Carboniferous volcanic rocks are rare. During the Upper Carboniferous (330-300 Ma) rivers carried

a great deal of sediment southwestwards across the continent and it was dumped at the mouth of these rivers in the form of deltas that grew out into a deepening ocean. These formed the shales that make up the higher ground just west of Newcastlewest.



***Megaloceras giganteus* - the Giant Irish Deer**

During the last 2 million years Ireland was subjected to a number of ice advances and ice retreats which collectively are known as the Ice Age. Various animals lived here during the warmer periods, and included bears, hippopotamus, mammoth, hyaenas, and Giant Irish Deer. This deer was a spectacular animal with the male carrying impressive antlers over 2 metres wide. These had to be grown every year. During summer the deer lived and fed on higher ground but in the colder winters they came down to lowland valleys to rest and feed. Fossils of these animals have been found at Lough Gur where it is thought that when they died they became washed into the lake. Overtime vegetation in-filled the lake and formed a raised bog. When this was excavated the fossils were located.

**Geological timescale showing age of rocks in Limerick**

## Cement

Cement in Ireland is manufactured at three locations in Ireland: Platin, Co. Meath, Edenderry, Co. Kildare and at Castlemungret, Co. Limerick. The Limerick Cement Works opened in 1938 and the plant was expanded in the 1950s. Cement is produced by combining crushed Lower Carboniferous limestone that is quarried locally with Silurian shale, a deep-water, fine-grained dark sedimentary rock. The mixture is then heated to 1500 degrees Centigrade and forms clinker, which is then powdered. Finally a small amount of the mineral Gypsum is added, and the process is complete.



**Limestone quarry at Mungret with Limerick Cement Works in the background**

## Norman Castles

The Normans came to Limerick in the late 1100s and rapidly began to build castles across the county to enforce their rule. Many of these castles were constructed of local stone - Lower Carboniferous limestone - as it was readily available from the immediate surroundings, and it was easy for the stone masons to work it and to cut it into blocks when required. The castles are largely Tower Houses with a square plan and several floors. Many of these are built on small limestone mudmounds as they would be drier than the surrounding areas and gave the occupiers a better viewpoint if attacked. These mudmounds developed on the Lower Carboniferous seafloor 350 Ma when corals and bryozoans all helped to trap a lot of lime mud and build small mounds that grew higher than the adjacent layers of lime mud that later became well-bedded limestone.

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