DOWN

AREA OF COUNTY: 2,448 square kilometres or 945 square miles

COUNTY TOWN: Downpatrick

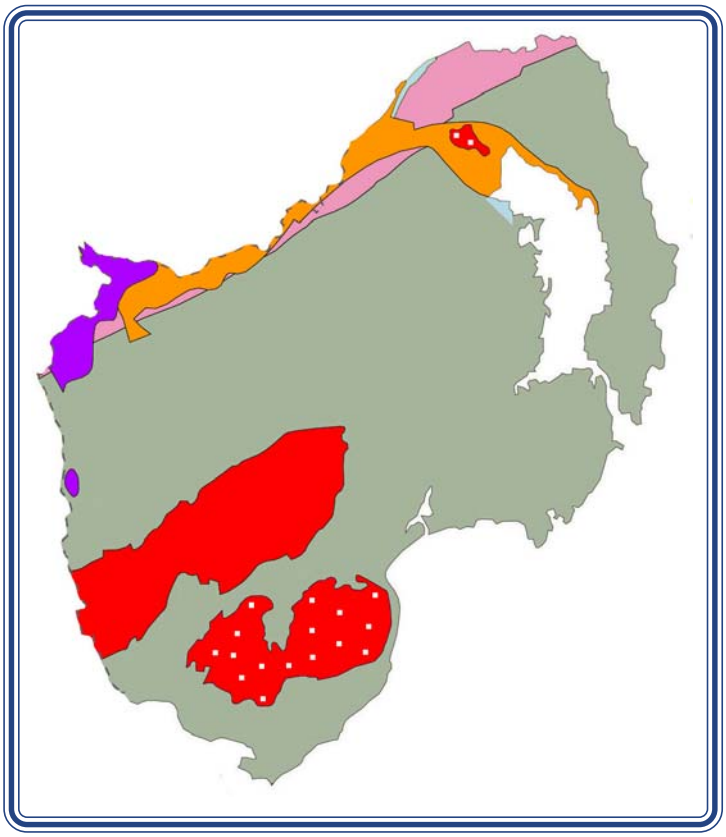
OTHER TOWNS: Banbridge, Bangor, Newry, Newtownards

GEOLOGY HIGHLIGHTS: Scrabo footprint, Ards peninsula greywackes, Mourne Mountains.

AGE OF ROCKS: Ordovician-Silurian; Carboniferous-Triassic, Paleogene

Mourne Mountains

These granite mountains are younger than most granite mountains in Ireland. They were intruded approximately 56 million years ago.



Geological Map of County Down

Pink: Lower Ordovician; **Grey:** Ordovician & Silurian; **Solid Red:** Devonian Granite; **Light blue:** Lower Carboniferous; **Orange:** Permian & Triassic; **Purple:** Paleogene Basalt; **Flecked Red:** Paleogene Granite and other intrusive rocks.

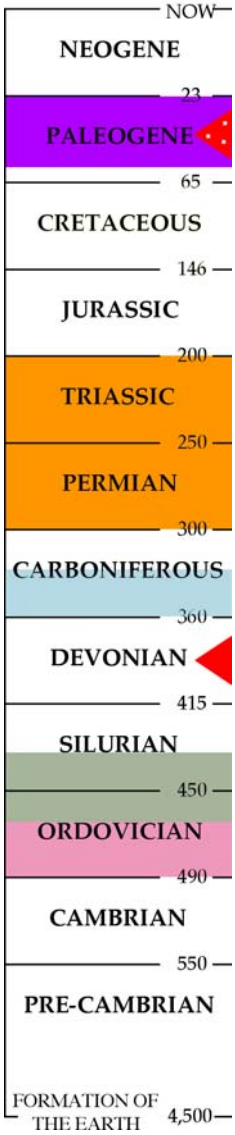
Geological history

The oldest rocks in County Down are 417-495 million years old [Ma] and consist of mudstones and volcanic rocks. At that time County Down lay beneath a deep ocean, on the edge of an ancient continent made up of Scotland, north America and the north of Ireland. A huge ocean separated this continent from the rest of Ireland, England, Wales and Europe. Over millions of years, this ocean closed and the two ancient continents collided, heating and deforming the rocks to form slates. The same rock types occur from Longford, through County Down and into the Southern Uplands of Scotland.

Around 350 million years ago, in the early Carboniferous, sea level slowly rose to flood across the landscape. Sand and mud deposited on flood plains and in lagoons was buried beneath thick limestones deposited in a tropical sea. Around 290 million years ago Earth movements, caused by continental plates

Red Triassic sandstones deposited in temporary rivers in a semi-desert environment (Cultra).

Fossil footprint of *Chirotherium*, an early reptile from Scrabo Quarry.



Geological timescale showing age of rocks in Down.

colliding, led to the erosion of most of these Carboniferous rocks in Co. Down and only a few small patches remain. The first rocks to be deposited on these eroding mountains during the Permian period were screes, made of angular pieces of the older rocks. Later Permian and Triassic rocks include a thin limestone and thick red sandstones and mudstones deposited in a harsh desert environment. Northern Ireland lay at about the same latitude as today's Sahara Desert. Examples of red sandstones and mudstones from this time occur in the Lagan Valley and around Dundonald and Comber.

Finally, about 56 Ma, the Mourne Mountains were formed when molten magma cooled slowly beneath the surface during a time Northern Ireland was covered by active volcanoes when the land rifted apart during the opening up of the north Atlantic Ocean.

Fossil squids and Reptiles

The rocks of the Ards Peninsula in particular are very similar, and it is only by the fossil graptolites in them that the structure of the rocks can be understood. Graptolites are an extinct group of animals that drifted and floated in the sea, but are now found in sea floor sediments that were squeezed together and faulted in multiple slices up against the continent

as the ocean closed. These fossils tell how old each structural slice is. Carboniferous limestones at Castle Espie at the northern end of Strangford Lough have remarkably large straight shelled nautiloids (cephalopods) up to one metre long. The sandstone quarries at Scrabo have yielded a rare footprintcalled *Chirotherium* that was made by a reptile believed to be *Ticinosuchus*.

J.E. Richey and the mapping of the Mourne Mountains

In the 1930s the Irish geologist James Ernest Richey used to holiday in Co. Down with his wife and three daughters, and during this time he mapped the geological structure of the Mourne Mountains. As he was a careful and skilled observer of geological features this took him several years to complete. His geological map remains one of the best still to be produced of the area.

Beryl from the Mourne Mountains

Beautiful pale blue (aquamarine) six-sided crystals of the mineral Beryl (pictured right) occur in the Mourne Granites and these can reach 15 cm in length. In the early 1800s the Hon. George Knox from Dungannon in Tyrone, who was the Member of Parliament for the University of Dublin, made a fine collection of these crystals.

Mining & Building Stones

The granite of the Mourne Mountains has provided a high quality building stone for centuries. In the 19th century it was widely used as setts as the crystals are small and the stone was hard-wearing under largely horse-drawn traffic. The Triassic sandstones near Belfast have been more important, quarried in places like Scrabo. Mining has been important in the past, with a significant lead mining centre at Conlig and Whitespots near Newtownards.

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