TYRONE

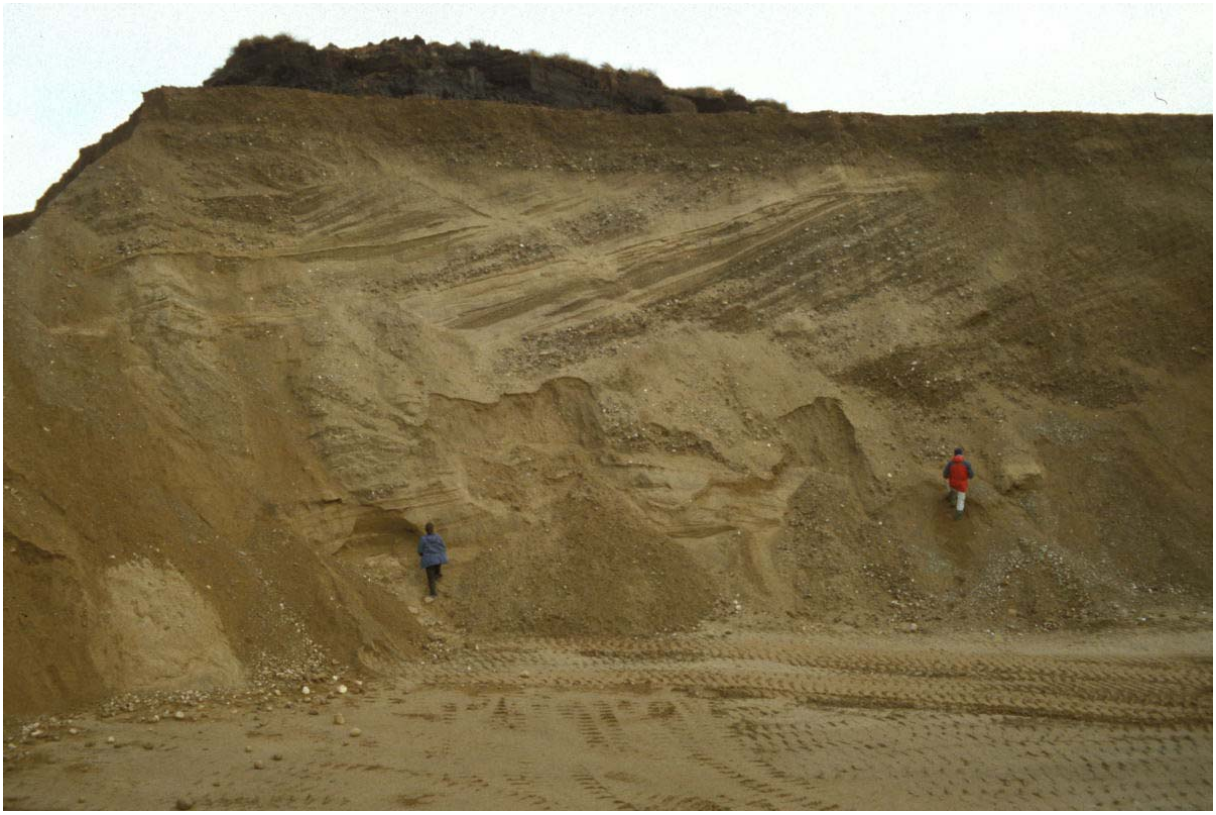
AREA OF COUNTY: 3,155 square kilometres or 1,218 square miles

COUNTY TOWN: Omagh

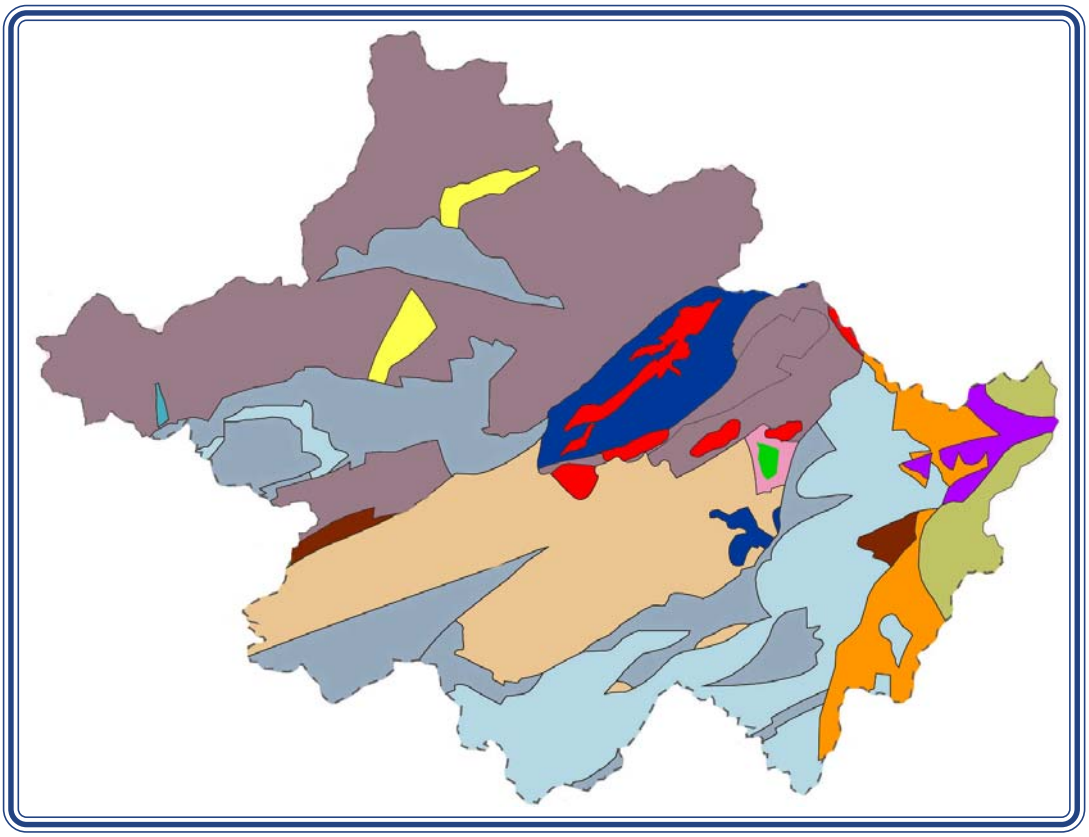
OTHER TOWNS: Cookstown, Coalisland, Dungannon, Pomeroy, Strabane

GEOLOGY HIGHLIGHTS: Gold, Coal, bricks and cement, fossils from Pomeroy

AGE OF ROCKS: Precambrian, Ordovician to Triassic, Cretaceous to Palaeogene, Pleistocene



Gravels deposited on a delta in a glacial lake in the Sperrin Mountains



Geological Map of County Tyrone

Pale purple: Precambrian Dalradian rocks; **Pale yellow:** Precambrian quartzites; **Dark blue:** Precambrian volcanic rocks; **Pink:** Ordovician; **Green:** Silurian; **Beige:** Devonian sandstones and conglomerates; **Red:** Granite; **Blue grey:** Lower Carboniferous sandstones; **Light blue:** Lower Carboniferous limestone; **Brown:** Upper Carboniferous shales; **Orange:** Triassic sandstones; **Purple:** Paleogene Basalt; **Olive green:** Paleogene Lough Neagh Clays.

Geological history

The geology of Tyrone is surprisingly diverse and complex and includes some of the oldest rocks in Northern Ireland. In the north of the county the Sperrin Mountains are formed largely of Precambrian schist, quartzite and marble. These rocks, originally deposited as silts, sands and limestones in a shallow sea around 600 million years ago [Ma], were transformed, or metamorphosed, into their present rock types by immense pressure and heat as the continental plates on either side of this ocean moved together. Earth movements almost 300 Ma later created fractures in these rocks, which were then filled with quartz. Some of these quartz veins contain economic deposits of gold. Much more strongly metamorphosed rocks than those of the Sperrins are found in a small area further south, to the west of Cookstown, and are believed to be perhaps as much as 900 [Ma].

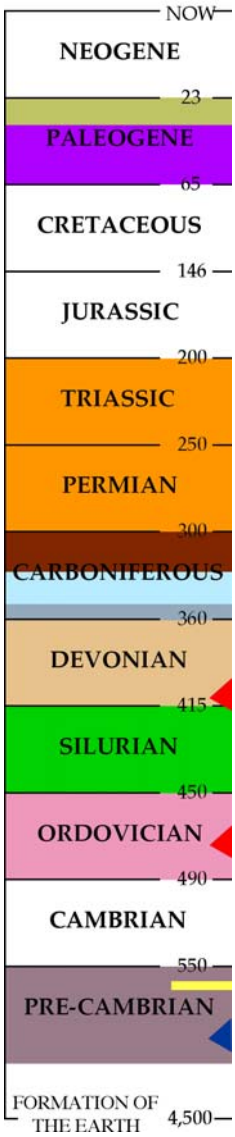
Carboniferous limestone & mudstone, Cookstown

Beneath the low ground south of the Sperrins are found volcanic rocks of Ordovician age, around 475-465 Ma ago, that erupted onto the bed of a deep ocean or solidified deep beneath the ocean floor without reaching the surface. A little further south still, immediately east of the small town of Pomeroy, are found rocks that are very different and a little younger, from about 460 to 440 Ma ago. These are sandstones, siltstones and, towards the top, dark mudstones. The sandstones, sometimes packed with fossils and among the most fossiliferous rocks of this age anywhere in Ireland, were deposited on a fairly shallow sea floor but the dark mudstones were deposited on the deep dark ocean floor.

A large area west of Pomeroy, and centred on the small town of Fintona, is underlain by sandstones, siltstones and pebble beds, often red in colour. These were deposited in rivers and flood plains during the Devonian, around 400 Ma, but contain no fossils other than a few plant spores. There was a brief period of volcanic activity around 375 Ma, producing lava flows and ash.

Much of the southern part of the county, and a smaller area in the west, are underlain by rocks of Carboniferous age, deposited around 350 to 320 Ma ago when what is now Ireland lay close to the Equator. Mudstones, sandstones and fossiliferous limestones were deposited on flood plains, tidal flats and in shallow seas. In the east of the county, around the appropriately named town of Coalisland, lies a small area of younger Carboniferous rocks often termed 'Coal Measures'. Rotting vegetation accumulated on the floor of poorly drained swamps and was buried by mud and sand to form the thin coal seams that were once mined near the town.

For almost 100 Ma following the Carboniferous the environment generally was rather arid as what is now Ireland lay towards the edge of the vast 'supercontinent' Pangea. For the most part the rocks from this time, the Permian and



Geological timescale showing age of rocks in Tyrone.

Triassic periods around 300 to 200 Ma ago, are red sandstones and mudstones deposited in a semi-desert. Very near the base is a fossiliferous cream-coloured 'Magnesian Limestone' around twenty metres thick, deposited by an incursion of the sea around 260 Ma ago. All of these rocks form areas of low ground in the south and east of the county and are seldom exposed.

A further three distinct ages of bedrock are found in the county, though all are confined to a small area of low ground in the east, between Cookstown and the shore of Lough Neagh, and all are very poorly exposed. The 80 million year old Ulster White Limestone, or Chalk, was deposited in open sea far from land during the Cretaceous. Above them the dark basalt layers of the Antrim Lavas were erupted onto a newly emerged land surface during the Paleocene, around 60 Ma. Lying on top of these lavas are the 30 Ma Lough Neagh Clays, deposited during the Oligocene when the area was covered by a vast swamp forest. Boreholes have revealed that within the layers of mud and sand are seams of lignite, or 'brown coal', almost forty metres thick.

The entire county has been buried beneath ice, probably several times, during the last million years or so. Ice sheets and glaciers have modified the landscape by erosion and by deposition of sand, gravel and 'boulder clay'. At times some of the deep valleys in the Sperrin Mountains were dammed by glaciers, creating glacial lakes into which deltas built up from sand and gravel brought in by tributary streams. Elsewhere, particularly across the low ground, the ice sheets left behind thick spreads of 'boulder clay' which now obscures the bedrock beneath.

Mining & Building Stones

Co Tyrone has a diverse range of Earth resources, reflecting its diverse geology. It is the most important region in Northern Ireland for gold deposits, with two mines currently operating. In the past coal mining was important around Coalisland, but the last mine closed in 1931. Bricks, tiles and pipes used to be made from Coal Measure clays and the Lough Neagh Clays near Coalisland, and bricks are still manufactured from Carboniferous mudstones near Dungannon. Carboniferous limestone and mudstone is used to manufacture cement at a large quarry near Cookstown. Glacial sand and gravel from former glacial lakes in the north of the county are an important source of aggregate for the construction industry.

Map adapted with permission from Geological Survey of Ireland 1:1,000,000 map 2003.
Image credits: Mike Simms (all).
Text by Mike Simms