

Derrygonnelly-Marble Arch-Cuilcagh Mountain, Fermanagh-south Tyrone area, Carboniferous, Northern Ireland

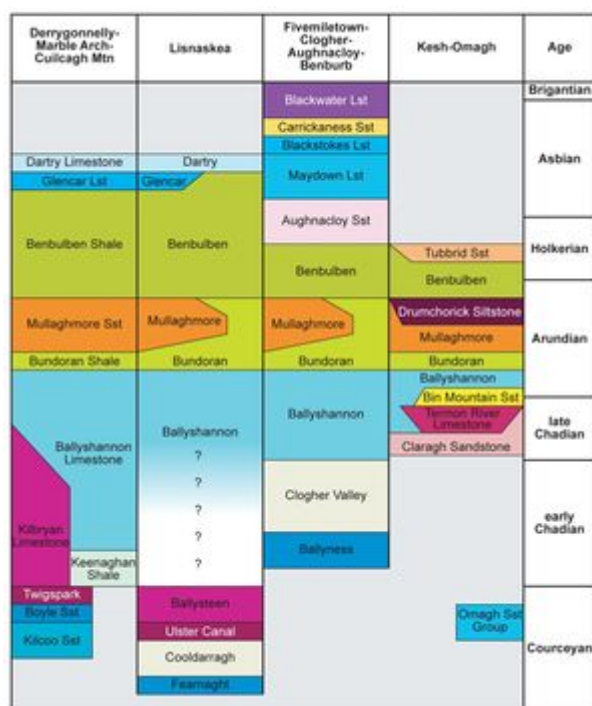
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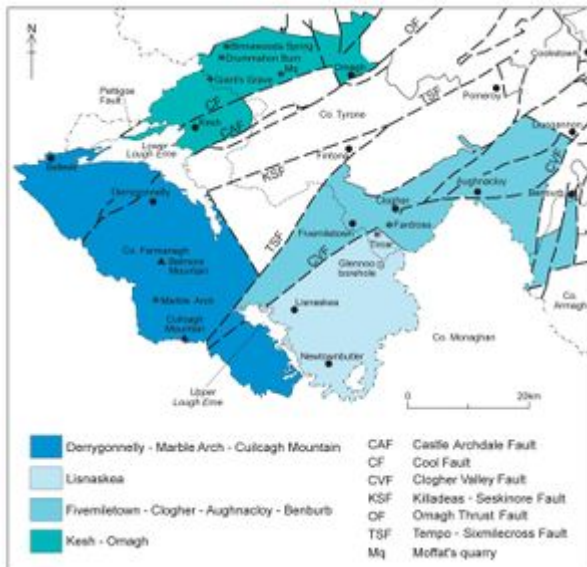
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Derrygonnelly-Marble Arch-Cuilcagh Mountain



Lithostratigraphy of the Tyrone Group in the four regions of Co. Fermanagh-south Co. Tyrone. (P947933)



Distribution of Carboniferous rocks in Co. Fermanagh - south Co. Tyrone. (P947821)

Formation	Lithology
Dartry Limestone (130-280m)	Limestone, dark grey, spicular, bluish black chert, fine-grained, fossiliferous; thin mudstone
Glencar Limestone (18-170m)	Limestone and mudstone in equal proportions; black chert nodules
Benbulbin Shale (90-365m)	Mudstone, grey, calcareous, fossiliferous; thin lenticular limestone and sandstone
Mullaghmore Sandstone (200m)	Sandstone, pale grey, orange-weathering, calcareous, fine- to medium-grained, subarkose; thin siltstone and mudstone
Bundoran Shale (60-555m)	Mudstone, dark grey, calcareous; siltstone, thin limestone; fossiliferous; basal sandstone
Dowra Sandstone Member (0-53m)	Pebble conglomerate, sandstone, mudstone, micritic 'limestone'
Ballyshannon Limestone (200-345m)	Limestone, lower and upper members are dark grey packstone and thin mudstone; middle member is pale fawn grainstone; fossiliferous
Magherameena Limestone Member (0-15m)	Waulsortian limestone
Keenaghan Shale (20m)	Mudstone, black, silty, rare miospores; thin sandstone; stromatolitic and micritic limestone

Lithostratigraphy of the Tyrone Group in the Derrygonnelly - Marble Arch - Culcagh Mountain area. (P947934)



Top bed of cherty facies limestones of the Dartry Limestone Formation with in situ colonies of *Siphonodendron irregulare*. Gortalughany, east side of Cuilcagh Mountain, Co. Fermanagh. (Hammer head 20 cm long). (P948001)

Formation	Lithology	Age
Lackagh Sandstone (36m)	Sandstone, pebbly, coarse-grained, fawn to white	Arnsbergian (pars)
Coisfaun Shale (55m)	Mudstone, calcareous, dark grey, fossiliferous	
Briscoonagh Sandstone (52m)	Sandstone, beds coarsening and thickening upwards; siltstone and mudstone	Pendinian
Dergvone Shale (130m)	Mudstone, dark grey to bluish black, fissile, ferruginous, siderite nodules; calcareous mudstone with ammonoids; sandstone in thin beds and dykes	
Carraun Shale (55m)	Mudstone, dark bluish grey, fossiliferous in lower half; five thin limestone members; sandstone dykes, bentonites, carbonate bullions	Brigantian
Belavally (45m)	Cyclical sediments of mudstone, subordinate siltstone, sandstone and stromatolitic and fossiliferous marine limestone	
Glenade Sandstone (75-300m)	Sandstone, pebbly, fawn to white; thin siltstone	Asbian (pars)
Meenymore (100-240m)	Non-cyclical mudstone, siltstone, sandstone and limestone	

Lithostratigraphy of the Leitrim Group on Cuilcagh Mountain. (P947935)



Contact between the Carraun Shale Formation (below) and Dergvone Shale Formation (Viséan-Namurian boundary). (b—bentonite, cm—Camderry Member of the Carraun Shale Formation). Altvenagh [H 129 289], Cuilcagh Mountain, Co. Fermanagh. (P948002)



Northeast face of Cuilcagh Mountain below the summit (665 m) showing the highest formations of the Leitrim Group, Co. Fermanagh. (P948003)

Tyrone Group

Tyrone Group rocks are about 2500 m thick ^[1] and are depicted on geological maps of the Derrygonnelly ^[2] and Kesh ^[3] areas. Beneath the oldest exposed unit, the Ballyshannon Limestone Formation, the Courceyan-early Chadian succession of four formations ([P947933](#)) is recorded in boreholes. The CM-Pu biozonal boundary is located near the base of the Kilbryan Limestone Formation.

West of the Pettigoe Fault ([P947821](#)), the sub-Carboniferous unconformity with the Moinian Lough Derg Group and the Keenaghan Shale Formation are exposed at Keenaghan Lough [G 973 600]. Black mudstones of early Chadian age contain miospores including rare *Lycospora pusilla* of the Pu Biozone. At the base of the Ballyshannon Limestone Formation, Waulsortian mud-mound facies limestone and mudstone of the Magherameena Limestone Member, exposed in Magherameena quarry [G 980 597] 4 km east of Belleek, contain *Eotextularia diversa* and *Tetrataxis* of early Chadian age.

Waulsortian facies limestone also occurs in Bellanaleck quarry [H 235 389], 12 km ENE of Marble Arch and contains brachiopods, rare solitary corals and the trilobites *Bollandia cf. rugiceps* and *Cummingella* sp. nov. of uppermost early Chadian age.

The lower and middle 'members' of the Ballyshannon Limestone Formation are exposed in quarries on the south shore of Lower Lough Erne at Blaney [H 167 525] and Carrickreagh [H 174 521]. They contain a late Chadian microfauna including *Eoparastaffella simplex* and monolaminar *Koninckopora* ^[1]. The highest limestones of the upper 'member', exposed at Inisway [H 163 518], 4.5 km east of Derrygonnelly, consists of grainstone and contain Arundian foraminifera including *Glomodiscus*, *Uralodiscus* and *Paraarchaediscus* at *involutus* stage. The Dowra Sandstone Member at the base of the Arundian Bundoran Shale Formation ([P947934](#)) consists of up to 53 m of sandstone and silty mudstone. Dark to medium grey calcareous mudstone, with a fauna dominated by solitary corals, is the main component of the Bundoran Shale Formation and crops out at Claragh [H 148 528], 3km ENE of Derrygonnelly.

The contact between the Mullaghmore Sandstone and Benbulbin Shale formations is exposed in a road cutting [H 123 512] near Derrygonnelly where the top bed of the former consists of 0.25m of oncolitic limestone with *Glomodiscus*, *Paraarchaediscus* and *Uralodiscus* of mid- to late Arundian

age. Higher parts of the Benbulbin Shale Formation contain an Asbian macrofauna including the brachiopod *Gigantoproductus*, solitary coral *Siphonophyllia benburbensis* and fasciculate coral *Siphonodendron pauciradiale* ^[1]. The junction between the Benbulbin Shale and Glencar Limestone Formation crops out in the Tullyhona stream [H 153 338], east of Marble Arch. The top of the Glencar Limestone in the Cladagh River [H 121 346], 100m northwest of Marble Arch, consists of calcareous sandstone, siltstone and thin limestone and is succeeded abruptly by the Knockmore Limestone Member of the Dartry Limestone Formation.

The Dartry Limestone Formation comprises ^[1] limestone with chert, and at the top a bed with in situ colonies of the coral *Siphonodendron irregulare* (P948001). Poorly and unbedded limestones of the mudmound facies are referred to the Knockmore Limestone Member. The succeeding members, the Cloghan Hill, Carrickmacsparrow, and Cloghany Limestone members are only developed in the Marble Arch-Cuilcagh Mountain area. ^[2] The Cloghany Limestone Member contains angulatus stage archaetidiscids and *Howchinia bradyana* and is of late Asbian age. At the top of the Dartry Limestone Formation on Cuilcagh Mountain the Carn Limestone Member is separated from the Meenymore Formation, at the base of the Leitrim Group, by an erosional gap ^[1]

In Cashel quarry [G 979 474], 14.5 km WSW of Derrygonnelly, mudstone near the top of the Dartry Limestone Formation contains the B₂ Biozone (late Asbian) ammonoids *Beyrichoceras*, *Bollandites*, *Bollandoceras*, *Entogonites borealis* and *Nomismoceras*.

Leitrim Group

The Leitrim Group consists of mudstone and sandstone with thin limestone and is characterised by major and minor cyclicity and the lateral persistence of individual beds across a wide region ^[4]. In Northern Ireland, the most complete section of the Leitrim Group (P947935) on Cuilcagh Mountain is 560 m thick ^{[1][2]}.

The Meenymore Formation ^[5] is generally poorly exposed but on the south side of Belmore Mountain in the Lurgan River [H 087 413] almost the full thickness of 48 m is present ^[6]. The ammonoids *Bollandoceras micronotum*, *Goniatites* sp. *maximus* group and *Nomismoceras vittigerum* indicate the late Asbian B_{2a} Subzone. The Glenade Sandstone Formation is widely exposed in the Fermanagh Highlands but only on Cuilcagh Mountain is there evidence of coarsening-upwards cycles, each one about 10 m thick. Basal pebbly, coarse-grained sandstone succeeds algal laminated carbonates of the Meenymore Formation in the Lurgan River.

The contact between the Glenade Sandstone Formation and the Bellavally Formation (P947935) is only exposed ^[1] in the Sruh Croppa River at Tromogagh [H 104 317]. Ammonoids recorded in the sequence give the ages of the various members ^[1]. A miospore assemblage of the VF Zone ^[7] in the Doobally Sandstone Member locates the Asbian-Brigantian boundary either at its base or in the underlying Drummangarvagh Member. The contact between the top of the Bellavally Formation (Corry Member) and the Derreens Limestone Member, the basal unit of the Carraun Shale Formation (P947935), is also exposed in the Sruh Croppa River [H 098 307]. In the middle of this Formation the distinctive Tawnyunshinagh Limestone Member is commonly exposed on Cuilcagh Mountain. Sandstone dykes intruding the mudstones are a feature of this part of the succession. At least eight thin K-bentonites (volcanic ash beds) are located mostly above the Sranagross Member. The Viséan-Namurian boundary coincides with the contact between the Carraun Shale and Dergvone Shale formations, 6.5 m above the Camderry Member (P948002).

A stream section at Altvenagh [H 120 293] exposes 70m of the Leitrim Group from below the Tawnyunshinagh Limestone Member into the Pendleian Dergvone Shale Formation. ^[1] The north face

of Cuilcagh Mountain ([P948003](#)) exposes the three highest formations of the Leitrim Group.

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