

# Closeburn Limestone Formation

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## Closeburn Limestone Formation (**CLO**), Carboniferous, Midland Valley of Scotland

Closeburn Limestone Formation is part of the [Yoredale Group](#)

### Name

From Closeburn, south of Thornhill, Dumfries and Galloway. Defined as a formation by McMillan (2002<sup>[1]</sup>; see also Menteath, 1845<sup>[2]</sup>; Pringle and Richey, 1931<sup>[3]</sup>; Jones, 1994<sup>[4]</sup>).

### Lithology

The formation consists dominantly of limestone and dolomitic limestone with interbedded sandstone, siltstone and mudstone.

### Genetic interpretation

The fauna (see below) of the limestone indicates that it is marine.

### Stratotype

A partial type section occurs in Upper Closeburn Quarry (Croalchapel Quarry) (NX 9100 9170 to 9120 9130). This section is in the upper part of the formation lying above the upper of two limestones separated by 5.5 m of strata. These limestone beds were noted by Geikie (1877)<sup>[5]</sup> but are not visible today. Pringle and Richey (1931)<sup>[3]</sup> indicated that about 12 m of sandstone, shale and fireclay lie above the upper limestone. McMillan (1991, and references therein<sup>[6]</sup>) provided logs of sections recorded in Croalchapel Quarry in 1962 at (NX 9109 9159) with siltstone (2.4.m), limestone (0.5 m) and sandstone (7.2 m) and at (NX 9109 9150) with siltstone (0.7 m), mudstone (0.1 m) and sandstone (1.8 m). A good section in the Closeburn Limestone Formation was cored in the BGS

Closeburn Borehole (BGS Registration Number NX99SW/2) (NX 9021 9145) between about 6.5 and 29.7 m depth, but the presence of unconformities at both the top and bottom of this section suggest the full thickness of the formation is not represented.

## Lower and upper boundaries

The unconformable base of the formation is taken where the greywacke sandstone of the underlying Silurian Gala Group passes upward into dominantly limestone strata.

The top of the formation is apparently conformable or disconformable with the base of the overlying grey, white and pink pebbly sandstone with beds of conglomerate of the Passage Formation (Figure 6, Column 6).

## Thickness

The maximum thickness of the formation is about 25 m.

## Distribution and regional correlation

The formation is limited to the Thornhill Basin. The fauna of the limestones suggests correlation with strata in the upper part of the Tyne Limestone Formation or Alston Formation (Yoredale Group) of the Solway Basin.

## Age and biostratigraphical characterisation

Late Viséan (late Asbian to Brigantian). The formation has corals, brachiopods (including productoids, gigantoproductoids and orthotetoids), gastropods, bivalves (including nuculids and various species of *Edmondia* and *Leiopteria*), orthocone and coiled nautiloids (including large specimens of the former) and fish. The overall aspect of the fauna suggests a late Viséan (late Asbian, B2 to Brigantian, P2) age (see McMillan, 2002; Table 2<sup>[1]</sup>).

## References

1. ↑ <sup>10</sup> <sup>11</sup> McMillan, A A.2002.Geology of the New Galloway and Thornhill district.*Memoir of the British Geological Survey*, Sheets 9E and 9W (Scotland)
2. ↑ Menteach, J S.1845.The Geology of Dumfriesshire.*Transactions of the Highland and Agricultural Society*, Vol. i, 289–311
3. ↑ <sup>30</sup> <sup>31</sup> Pringle, J, and Richey, J E.1931.Carboniferous rocks of the Thornhill Basin, Dumfriesshire. 25–33 in Summary of Progress of the Geological Survey of Great Britain for 1930. (London: His Majesty's Stationary Office.)
4. ↑ Jones, N S.1994.Core log of the BGS Closeburn Borehole [NX 90210 91450].*British Geological Survey Technical Report*, WH/94/147R.
5. ↑ Geikie, A.1877.Explanation of Sheet 9: Kirkcudbright (north-east part) and Dumfriesshire (south-west part).*Memoirs of the Geological Survey*, Scotland.
6. ↑ McMillan, A A.1991.Loch Ettrick. 1:10 000 Scale Geological Sheet NX99SW (Solid).*British Geological Survey*.

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