Upper Limestone Formation

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Jump to navigation Jump to search
□

Contents

Upper Limestone Formation (ULGS), Carboniferous, Midland Valley of Scotland

Upper Limestone Formation is part of the Clackmannan Group.

Name

Forsyth et al. (1996)[1] changed the name Upper Limestone Group to Upper Limestone Formation. The boundary definitions were unaffected.

Lithology

The Upper Limestone Formation (see Browne et al., 1999, fig. 5[2]) is characterised by repeated upward-coarsening cycles comprising grey limestone overlain by grey to black mudstones and calcareous mudstones, siltstones and paler sandstones capped by seatrocks and coal. The limestones contain marine faunas and are usually argillaceous. These limestones are laterally extensive and have standard names that can be used throughout the Midland Valley. The proportion of limestone increases to the west. The sandstones are generally off-white and fine- to medium-grained. The coals are usually less than 0.6 m thick. Minor lithologies include ironstone and cannel, and there are some volcanic rocks. Upward-fining sequences of coarse- to fine-grained sandstones passing up into finer-grained rocks are also present.

Genetic interpretation

The formation comprises *mixed shelf carbonate and deltaic ('Yoredale') facies*. The lower parts of the cycles, including almost all limestones and many mudstones, were deposited in marine environments. The upper parts of the cycles, including sandstones and coals, were deposited as progradational lobate deltas. The increase in the proportion of limestone to the west, indicates increasingly marine conditions in that direction (Francis, 1991[3]).

Stratotype

The type section of the Upper Limestone Formation is the Mossneuk Borehole (BGS Registration Number NS88NE/204) (NS 8723 8609), south of Alloa, between 335.0 and 770.3 m depth (see Browne et al., 1999, fig. 5, col. 6[2]).

Lower and upper boundaries

The base of the formation is taken at the base of the Index Limestone (ILS) or, locally, at a plane of disconformity, in both cases underlain by cyclic sedimentary rocks of the Limestone Coal Formation (Figure 6, Column 4).

Where the Upper Limestone Formation is fully developed, the top is drawn at the top of the Castlecary Limestone (CAS), overlain by cyclic sedimentary rocks of the Passage Formation.

Thickness

The maximum thickness of the formation is over 600 m in the Clackmannan area of the Central Coalfield (Browne et al., 1985, p. 11[4]). It is less than 100 m thick in Ayrshire. Generalised thickness were given of 90–140 m on Arran (BGS, 1987[5]) and 87.5 m in the main coalfield area at Machrihanish (BGS, 1996[6]).

Distribution and regional correlation

Throughout the Midland Valley of Scotland, the Isle of Arran and at Machrihanish.

Age and biostratigraphical characterisation

Namurian (Pendleian to Arnsbergian). Ammonoids including *Tumulites pseudobilinguis* recovered from the Index Limestone, *Eumorphoceras bisulcatum grassingtonense* from the Orchard Limestone, *E..B. ferrimontanum* and *'Cravenoceras' gairense* from the Calmy Limestone, and *Cravenoceratoides nitidus* from the Castlecary Limestone provide evidence for the E1b2 to E2b2 age of the formation (see Ramsbottom, 1977b[7]). According to Wilson (1967)[8] the brachiopod *Antiquatonia costata* is only found in the Orchard Limestone, whilst *Pugnax* cf. *pugnus* and *Sinuatella* cf. *sinuata* (with the bivalve *Actinopteria regularis*) are only associated with the Calmy Limestone. The gastropods *Meekospira* sp. in the Index Limestone, *Straparollus (Euomphallus) carbonarius* in the Orchard Limestone and *Euphemites ardenensis* with the bivalve *Edmondia punctatella* in the Calmy Limestone fauna have short vertical ranges with their acme at the level mentioned. The bivalve *Streblopteria ornata* disappears after ranging up to the Lyoncross Limestone, whilst the nautiloid *Tylonautilus nodiferus* has not been found below the Calmy Limestone. The nonmarine bivalve genera in the formation are *Curvirimula* and *Naiadites*.

References

1. ↑ Forsyth, I H, Hall, I H S, and McMillan, A A. 1996. Geology of the Airdrie district. *Memoir of the British Geological Survey*, Sheet 31W (Scotland)
2. ↑ [2.0] [2.1] Browne, M A E, Dean, M T, Hall, I H S, McAdam, A D, Monro, S K, and Chisholm, J I. 1999. A lithostratigraphical framework for the Carboniferous rocks of the Midland Valley of Scotland. *British Geological Survey Research Report*, RR/99/07
3. ↑ Francis, E H. 1991. Carboniferous. 347–392 in Geology of Scotland (3rd edition). Craig, G Y (editor). (London: The Geological Society.)

4. ↑ Browne, M A E, Hargreaves, R L, and Smith, I F. 1985. The Upper Palaeozoic basins of the Midland Valley of Scotland. *Investigation of the geothermal potential of the UK*. (Keyworth, Nottingham: British Geological Survey.)
5. ↑ British Geological Survey. 1987. Arran. Scotland Special Sheet, 1:50.000 Series. Bedrock. (Southampton: Ordnance Survey for the British Geological Survey.)
6. ↑ British Geological Survey. 1996. Campbeltown. Scotland Sheet 12, Provisional Series. Solid and Drift 1:50.000. (Keyworth, Nottingham: British Geological Survey.)
7. ↑ Ramsbottom, W H C. 1977. Correlation of the Scottish Upper Limestone Group (Namurian) with that of the North of England. *Scottish Journal of Geology*, Vol. 13, 327–330.
8. ↑ Wilson, R B. 1967. A study of some Namurian marine faunas of central Scotland.*Transactions of the Royal Society of Edinburgh*, Vol. 66, 445–490.

Category:

- Carboniferous lithostratigraphical nomenclature

Navigation menu

Search

Search Go

Navigation

- Main page
- Recent changes
- Random page
- Help about MediaWiki

Tools

- What links here
- Related changes
- Special pages
- Permanent link
- Page information
- Cite this page
- Browse properties

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- Privacy policy
- About Earthwise
- Disclaimers
-
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