

Rossendale Formation

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Rossendale Formation ([ROSSE](#)), Carboniferous, Northern England Province

Rossendale Formation is part of the [Millstone Grit Formation](#)

Name

The new name Rossendale Formation is proposed to identify all Millstone Grit Group strata of Yeadonian age. The Rossendale Formation is equivalent to the former Rough Rock Grit Group of Bradford (Stephens et al., 1953^[1]), a term considered unsuitable as there is also a Rough Rock and Rough Rock Flags for individual sandstones within the formation. The new name was chosen from the Forest of Rossendale (SD 80 20).

Lithology

A fine- to very coarse-grained and pebbly, feldspathic sandstone, interbedded with grey siltstone and mudstone, and subordinate marine black shales, thin coals and seatearths. Typically, the formation comprises a lower mudstone-dominated succession including two prominent marine shales, the *Cancelloceras cancellatum* (G1A1) and *Cancelloceras cumbriense* (G1B1) marine bands, and an upper sandstone-dominated succession, including the Rough Rock and Rough Rock Flags.

Genetic interpretation

During the early Yeadonian a thick succession of dark mudstones was associated with two widespread marine transgressions, evident as the *Cancelloceras cancellatum* and *Cancelloceras cumbriense* marine bands. Small contributions of sediment from the west are recognised in Yeadonian times with the Upper and Lower Haslingden Flags of Lancashire. These are interpreted as deposits within a birdsfoot delta (Collinson and Banks, 1975^[2]). McLean and Chisholm (1996)^[3]

showed this westerly source of sediment became more important and extensive during the Westphalian. The upper part of the succession is dominated by the sheet-sandstone of the Rough Rock. The sandstone is typically very coarse-grained and up to 45.m thick. It was deposited from braided river channels generally flowing towards the south-west (Bristow, 1988^[4]). Heavy-mineral studies have demonstrated the northerly provenance of the Rough Rock (Cliff et al., 1991^[5]), but with intermixing from a southerly source in the proximity of the Wales-Brabant Massif (Chisholm and Hallsworth, 2005^[6]).

Stratotype

The type area is the Forest of Rossendale (SD 80 20) which provides excellent sections, representative of much of the succession including the sandstone of the western (Haslingden Flags) and northern provenance (Rough Rock), as well as a good exposure of the basal marine band (Wright et al., 1927^[7]). Reference sections include the Orchard Farm stream section, south-west of Buxton (SK 0226 6903) which is the Stage stratotype for the Yeadonian, with both the *Cancelloceras cancellatum* and *Cancelloceras cumbriense* marine bands present within a section about 17.m thick (Ramsbottom, 1981^[8]). Elland Bypass (A629) roadcut, near Halifax (SE 103 215) provides a 500 m long and up to 30 m high section in the Rough Rock and Rough Rock Flags (Bristow and Myers, 1989^[9]). The BGS Winksley Borehole (BGS Registration Number SE27SE/9) (SE 2507 7150), in the southern part of the Askrigg Block, includes the Rossendale Formation from about 29.7 to 55.89 m depth (Cooper and Burgess, 1993). The Ballavaarkish (Shellag North) Borehole (NX 4625 0070), north Isle of Man includes the Rossendale Formation from 138.4 to 164.55 m depth, including a 7 m thick, fine- to coarse-grained, cross-bedded, feldspathic sandstone contemporaneous with (though mineralogically and apparently provincially distinct from) the Rough Rock of the Pennine Basin. Also occurring are palaeosols and listric claystones, one of which, near the base of the formation, may include the upper part of the *Cancelloceras cumbriense* Marine Band (Chadwick et al., 2001^[10]).

Lower and upper boundaries

The sharp conformable base of the formation is taken at the base of the dark grey, fissile mudstone of the *Cancelloceras cancellatum* Marine Band with an eponymous fauna, where the formation overlies the Marsden Formation (Figure 9, Column 17; Figure 15, Column 5). It typically overlies quartz-feldspathic sandstone of the Huddersfield White Rock (Yorkshire), Holcombe Brook Grit (Lancashire), Chatsworth Grit (Derbyshire).

The top of the formation is taken at the sharp conformable base of the dark grey, fissile mudstone of the Subcrenatum Marine Band (SBMB) with an eponymous fauna present at the base of the Pennine Coal Measures Group. Typically, the marine band rests upon coarse- or very coarse-grained and pebbly sandstone of the Rough Rock.

Thickness

Rochdale (Rossendale) 130 m; Bradford and north Derbyshire 75.m; Stainmore Trough and Askrigg Block 45.m; north Isle of Man 26.m.

Distribution and regional correlation

The formation occurs in the Central Pennine Basin from Lancashire and West Yorkshire, between Lancaster (SD 47 61) and Harrogate (SE 30 55), extending southward to north Staffordshire (SK 06), the Askrigg Block (SE 10 80) and Stainmore Trough (SD 85 15), and locally on the north of the Isle of Man (NX 46 00).

Age and biostratigraphical characterisation

Yeadonian (G1). The base of the formation is taken at the base of the *Cancelloceras cancellatum* Marine Band and the top at the base of the Subcrenatum Marine Band.

Local notes

In the Stainmore Trough, the equivalent of the *Cancelloceras cancellatum* marine band lacks the diagnostic ammonoid fauna and was referred to as the Swinstone Bottom Marine Band by Owens and Burgess (1965)^[11]. The Subcrenatum Marine Band (at the base of the Pennine Coal Measures Group), has not been proved across most of northern Great Britain. However, the Swinstone Top Marine Band of Owens and Burgess (1965)^[11] and a *Lingula*-band proved in the BGS Winksley Borehole (see above) (Figure 9, Column 17) probably equate with it. On the north Isle of Man the top of the formation in the Ballavaarkish (Shellag North) Borehole (see above) occurs where the fine- to coarse-grained, cross-bedded, feldspathic sandstones of the Rossendale Formation (Figure 8, Column 9) are superseded by palaeosol and dark grey to black claystone, including sporadic fossils in the Subcrenatum Marine Band (SBMB).

References

1. [↑](#) Stephens, J V, Mitchell, G H, and Edwards, W. 1953. Geology of the country between Bradford and Skipton. *Memoir of the Geological Survey of Great Britain*, Sheet 69 (England and Wales).
2. [↑](#) Collinson, J D, and Banks, N L. 1975. The Haslingden Flags (Namurian G1) of South East Lancashire: Bar finger sands in the Pennine Basin. *Proceedings of the Yorkshire Geological Society*, Vol. 40, 431–458.
3. [↑](#) McLean, D, and Chisholm, J I. 1996. Reworked palynomorphs as provenance indicators in the Yeadonian of the Pennine Basin. *Proceedings of the Yorkshire Geological Society*, Vol. 51, 141–151.
4. [↑](#) Bristow, C S. 1988. Controls on the sedimentation of the Rough Rock Group (Namurian) from the Pennine Basin of northern England. 114–131 in *Sedimentation in a synorogenic basin complex: the Upper Carboniferous of Northwest Europe*. Besly, B M, and Kelling, G (editors). (Glasgow and London: Blackie.)
5. [↑](#) Cliff, R A, Drewery, S E, and Leeder, M R. 1991. Sourcelands for the Carboniferous Pennine river system: constraints from sedimentary evidence and U-Pb geochronology using zircon and monazite. 137–159 in *Developments in Sedimentary Provenance Studies*. Morton, A C, Todd, S, P, and Haughton, P D W (editors). *Geological Society of London Special Publication*, No. 57.
6. [↑](#) Chisholm, J I, and Hallsworth, C R. 2005. Provenance of Upper Carboniferous sandstones in east Derbyshire: role of the Wales–Brabant High. *Proceedings of the Yorkshire Geological Society*, Vol. 55, 209–233.
7. [↑](#) Wright, W B, Sherlock, R L, Wray, D A, Lloyd, W, and Tonks, L H. 1927. The Geology of the Rossendale Anticline. *Memoir of the Geological Survey of Great Britain*
8. [↑](#) Ramsbottom, W H C. 1981. Fieldguide to the boundary stratotypes of the Carboniferous stages in Britain. Biennial Meeting of the Subcommission of Carboniferous Stratigraphy, Leeds.
9. [↑](#) Bristow, C S, and Myers, K. 1989. Detailed sedimentology and gamma-ray log characteristics of a Namurian deltaic succession 1: Sedimentology and facies analysis. 75–80 in *Deltas: Sites and Traps for Fossil Fuels*. Whateley, M K G, and Pickering, K T (editors). *Special Publication of the Geological Society of London*, No. 41.
10. [↑](#) Chadwick, R A, Jackson, D I, Barnes, R P, Kimbell, G S, Johnson, H, Chiverrell, R C, Thomas, G S P, Jones, N S, Riley, N J, Pickett, E A, Young, B, Holliday, D W, Ball, D F, Molyneux, S G,

Long, D, Power, G M, and Roberts, D H.2001.The geology of the Isle of Man and its offshore area.*British Geological Survey Research Report*, RR/01/06.

- ↑ ^{11.0} ^{11.1} Owens, B, and Burgess, I C.1965.The stratigraphy and palynology of the Upper Carboniferous outlier of Stainmore, Westmorland.*Bulletin of the Geological Survey of Great Britain*, No. 23, 17-44.

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