

Bottoms Beck

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Bottoms Beck, Gisburn Forest, Lancashire [SD 745 565 to 757 598]

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Map extract from DigMap50k showing the location of Bottoms Beck and the distribution of Pendleside Limestone Formation (in turquoise), including limestone boulder bed (in purple) with overlying Bowland Shale Formation present to NW and underlying Hodder Mudstone Formation to SE.

Summary

The Bottoms Beck exposure provides partial sections within the Pendleside and Bowland Shale formations, located in the north-western limb of the Slaidburn Anticline (Arthurton et al., 1988).

[Bowland Shale Formation](#)



Bottoms Beck,
Gisburn Forest.
Lower Bowland
Shales. Crinoidal
mudstone
(Brigantian) with
fragments of
limestone,
including pale
wackestones of
reef facies and
medium and
coarse
calcarenites.
[P005728](#).

Tributaries of Bottoms Beck [SD 7576 5980 to 7579 5978] expose mudstones presumed to overlie the Malhamense Marine Band (upper part of Bowland Shale Formation); these beds include an intercalation of siltstone with laminae and thin beds of fine-grained sandstone carrying [sole-marks](#) and containing a slumped layer. The uppermost mudstones [e.g. SD 7555 5932] are conspicuously laminated and contain ironstone nodules (Arthurton et al., 1988 p. 74)^[1].

Sections in Bottoms Beck expose a sandstone of P_{1b-d} age (Arthurton et al., 1988 p. 68). Some 16 m are seen, faulted at the top, in Bottoms Beck [SD 7470 5685], and comprise thick- and thin-bedded fine-grained sandstone, partly micaceous and carbonaceous, interbedded with silty mudstone and 'striped beds'. [Sole-marks](#) are recorded, including groove-casts trending N40°W. This sandstone is underlain by mudstone with bullions and boulders of dark, crinoidal limestone (see Parkinson, 1936, plate 25).

Key fossils:

The basal mudstones, faulted against the boulder-bearing mudstones [SD 7463 5667], have yielded *Goniatites striatus* and *G. spirifer*, indicating a P1b age.

[Pendleside Limestone Formation](#)

About 50 m of the well bedded limestone subdivision are exposed in two sections in Bottoms Beck in Gisburn Forest, Lancashire (Arthurton et al., 1988 p. 62). The lower sequence [7450 5657 to 7452 5659] includes thick-bedded, heavily slump folded limestones, with mudstone clasts and shelly and crinoidal debris at the base, resting on mudstone. The upper [7456 5671 to 7454 5662] comprises 36 m of well planar bedded limestone (beds mostly less than 0.5 m), faulted near the top, with a detailed log of 14 m of the succession reproduced by Gawthorpe (1986 p. 195)^[2] [LINK TO SECTION](#). The principal lithologies are partly [dolomitic](#), medium-dark grey, fine, upward fining calcarenite packstones and grainstones, mostly well laminated but partly bioturbated, and medium-dark grey calcisiltites [LINK TO LOCALITY IMAGE](#)]. Subordinate lithologies are [calcirudites](#) and medium to coarse [calcarenite](#) packstones and grainstones, mostly in sharp-based, graded beds, and lime-mudstones occur at the tops of many of the graded beds in the uppermost part of the sequence. Chert nodules are common, and many limestone beds are capped by band of chert. A thin section of a laminated fine [calcarenite](#) grainstone from this sequence showed it to be peloidal and bioclastic, with peloids, calcispheres, foraminifera and crinoid plates as the principal grains. The grainstone includes lithoclasts of [wackestone](#) and lime-mudstone, and shows slight matrix neomorphism (Arthurton et al., 1988 p. 62).

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|---|---|
| <p>✘</p> <p>Pendleside Limestone Formation at Bottoms Beck, Gisburn Forest. Well-bedded calcisiltites and fine and medium calcarenites. Chert prominent at tops of beds. P005700.</p> | <p>✘</p> <p>Bottoms Beck, Gisburn Forest. Detail of well-bedded partly dolomitic fine calcarenites towards the base of the Pendleside Limestone Formation. Laminated and bioturbated fabrics are apparent, and individual beds are capped with nodules or layers of chert. P005701.</p> |
|---|---|

Key fossils:

MAP TO GO HERE

Log of facies association 3. Sequence consists of planar bedded lime mudstone/wackestone facies interbedded with upward fining calcarenites and occasionally mudstones. Bioclasts are generally highly comminuted with macrofauna restricted to the allochthonous calcarenites. The sequence is extensively bioturbated, and chert nodules are common. Pendleside Limestone, Bottoms Beck. SD 745 566.

Foraminiferal assemblages in 22 samples from this stream section include archaedisks at the *angulatus* and *concaus* stages, *Archaediscus* sp., *Earlandia moderata*, *Endostaffella* sp., *Koskinotextularia cribriformis*, *Mediocris mediocris* and *Nodosarchaediscus* sp., and are considered to be Holkerian to Asbian in age, although several archaedisks at the *involutus* stage suggest some reworking of older Arundian sediments. (Arthurton et al., 1988 p. 62).

Structure

Chevron folds with north-east-trending axes are present in a section [7455 5670] in Bottoms Beck. The chevron folds in the Pendleside Limestone are truncated northeastwards against one of the faults of the Knotts Fault System; strata to the north-east of that fault are free from such folds.

See also

[Pendleside Formation \(PDL\)](#)

- [Burst Clough](#)
- [Cutlers Quarry](#)
- **Bottoms Beck**
- [River Hodder](#)
- [Hambleton Quarry](#)

References

1. ↑ ARTHURTON, R S, JOHNSON, E W, and MUNDY, D J C. 1988. *Geology of the country around Settle*. Memoir of the British Geological Survey Sheet 60 (England and Wales).
2. ↑ GAWTHORPE, R. 1986. Sedimentation during carbonate ramp-to-slope evolution in a tectonically active area: Bowland Basin (Dinantian), N. England. *Sedimentology*, Vol. 33, 185-206.

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