

Geology of the Bath area: Triassic

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This topic provides a summary of the geology of the Bath area - covered by the British Geological Survey

1:50k geological map sheet 265.

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By the Early Triassic, the northern part of Pangaea, which included the British Isles, lay a little north of the equator. The wider region was still largely high ground, and although alluvial sediments (Sherwood Sandstone Group) were probably being deposited to the east, it was not until Late Triassic (Carnian to Norian) times that deposition recommenced in the Bath district.

Carnian to Norian

Rocks of Carnian to Norian age in the Bath district are assigned to the Mercia Mudstone Group (MMG), which crops out around Corston in the south, and in a continuous outcrop from Bitton northwards to Chipping Sodbury. The group below the Blue Anchor Formation largely comprises red dolomitic mudstone with greenish laminae and subordinate evaporite beds, totalling up to 80 m in thickness at outcrop. A number of pale grey sandstone and siltstone beds, known as 'skerries', occur towards the top. A celestite-bearing mudstone, about 1 m thick, is also recognised in the upper part in the area between Oldland Common [68 71] and Siston [67 75]. It is thought to represent the Yate Evaporite Bed (YE) of Kellaway and Welch (1993, p.135)^[1]. Although absent over the Bath Axis, the group reappears at depth in the south and east, thickening to almost 300 m. The Mercia Mudstone Group represents the deposits of euhaline playa lakes and sabkha-type mudflats. In contrast, the Mercia Mudstone Marginal Facies (MMMMF; formerly known as the 'Dolomitic Conglomerate') comprising breccia, conglomerate and sandstone with dolomitic cement, represents screes, alluvial fans and wadi deposits developed along the margins of the playa lakes and sabkha flats. The facies is markedly diachronous, persisting throughout the Mercia Mudstone Group wherever it overlies the Palaeozoic rocks, but crops out only around Wick in this district, reaching perhaps 30 m in thickness.

Rhaetian



The Penarth Group at Chipping Sodbury railway cutting. Exposed during excavation in 1901, mudstone beds of the Cotham Formation are overlain by the prominent limestone of the White

Lias Formation, succeeded by interbedded mudstone and limestone of the basal part of the Blue Lias Formation. Approximate location [7285 8160]. (Photographer S H Reynolds; P239116).

The red mudstone of the undivided Mercia Mudstone Group grades rapidly up into the Blue Anchor Formation (BA_n), an up to 5 m-thick succession of grey, greenish grey and green partly dolomitic mudstone, its green colouration indicating a reducing environment and reflecting a change to a wetter climate. At this time the landscape of the district comprised extensive coastal flats, interrupted by denuded outcrops of Palaeozoic rocks which formed low-relief hills.

The Mercia Mudstone Group is disconformably overlain by the Penarth Group (PnG), formed by a continuation of the marine transgression which began with the deposition of the Blue Anchor Formation, and persisted throughout Rhaetian times and into the Early Jurassic. Consequently the group oversteps the older Triassic rocks to lie unconformably upon the Palaeozoic rocks in the north and east of the district, as seen in the inliers at Wick, Codrington, and in the Chipping Sodbury railway cutting. The group thins north from 10 m to less than 7 m, but its outcrop is too narrow to be subdivided on the map. It may also thicken south-eastwards at depth. The basal division, the Westbury Mudstone Formation, comprises 3 to 5 m of very dark grey to black pyritic mudstone, with thin muddy limestone beds and locally a basal bed containing pebbles and abundant fish teeth and vertebrate debris ('Rhaetic Bone Bed'). The formation yields a varied fauna including fish, gastropods and bivalves. Overall, the Westbury Mudstone represents deposition in a series of fringing lagoons. A transition from lagoonal to more open marine environments is represented by the overlying Cotham Formation, which comprises about 3 m of grey-green mudstone, calcareous mudstone and limestone, with a thin stromatolitic limestone (the Cotham Marble) at the top. The succeeding White Lias Formation is a 0.6 to 3 m-thick unit of pale, well-bedded limestone with thin mudstone interbeds (**P239116**) (Donovan and Kellaway, 1984)^[2]. A shallow marine setting is envisaged for the deposition of this unit, with the sea bed suffering periods of emergence. An erosion surface that caps the highest limestone in the succession is marked by desiccation cracks and numerous Diplocraterion burrows.

References

1. [↑](#) Kellaway, G A, and Welch, F B A. 1993. Geology of the Bristol district. Memoir of the British Geological Survey.
2. [↑](#) Donovan, D T, and Kellaway, G A. 1984. Geology of the Bristol district: the Lower Jurassic rocks. Memoir of the British Geological Survey.

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