

2.5.3 Bray Valley Quarries

Intensive folding in sandstones and shales, sandy facies of Pilton Shale Formation, Brayford Quarry

Photo BR1

From SS 6869 3379

Elevation 180m AOD. Facing SW-W



Bray Valley Quarries are situated north of South Molton close to the southern edge of Exmoor. An example of the style of folding is seen in the west face at Brayford Quarry. At the left edge of the photo the beds are dipping northwards on the northern limb of an anticline. Immediately to the right of this is a very sharp syncline, possibly part faulted. The beds on the southern limb of this at the centre of the photo are close to vertical, slightly overturned to the south. Towards the right side these vertical beds are seen on the skyline to turn over to the north to dip northwards again on the southern limb of another syncline.

The sandstone-rich strata worked in each of the two quarries at Bray Valley, and previously worked in other nearby disused quarries, are believed to be repeated by the folding and occasional faulting.

The Pilton Shale Formation, about 500m thick, spans the Devonian-Carboniferous boundary and the strata at Bray Valley are relatively low in this sequence, of Upper Devonian age, about 370 million years old. At that time this area is believed to have been situated close to the equator and the geography and environment of formation were completely different from the conditions of today. At Bray Valley the proportion of sandstone is higher than usual, providing the opportunity for production of aggregates

The Pilton Shale Formation outcrops in a broad band across North Devon trending approximately east-west and extending westwards to Barnstaple and the coast.

Bray Valley Quarries Examples of ripple marks and cross bedding, sandy facies of Pilton Shale Formation

Photo BR 6 At SS 6906 3273 Elevation 165m AOD Barton Wood Quarry, Facing South



Photo BR 7 From loose block, Brayford Quarry



The sediments of the Pilton Shale Formation generally have the characteristics of origin in a shallow, near-coastal sea along the northern edge of a subsiding marine basin.

The thick beds of predominantly sandstones occurring locally in the Bray Valley area are unusual in being much coarser grained overall than the strata of the same formation elsewhere in North Devon.

These sedimentary features typify the interpretation of the origin of this sandy facies of the Pilton Shale Formation as a finger of a delta extending from the shoreline situated to the north.

2.5.4 Venn Quarry

General view of current working area.

Photo VE 1 From SS 5773 3053 Elevation 75m AOD Facing East



Venn Quarry is about 3.5 km south-east of Barnstaple and close to the village of Landkey.

Venn Quarry is in the lowest part of the Crackington Formation of Upper Carboniferous (Namurian) age, about 320 million years old. About 150m thickness is worked at Venn where the proportion of sandstone in the strata is richer than usual.

The most obvious geological feature is the steeply southward-dipping sedimentary sequence of alternating greywacke sandstones and shales typical of this sandstone-rich facies of the Crackington Formation. The strike of the strata is generally west-east in the direction of the photo and the quarry is elongate in this direction.

The strata were originally laid down horizontally as sediments beneath the sea in relatively deep water. The individual beds of greywacke sandstones, known as turbidites, were formed by intermittent high-density, sediment-laden underwater currents flowing down the basin slope into the deep water. The coastline was to the north close to the present position of South Wales. The steep dip of the strata was introduced later in the Carboniferous when the stress of the continental collision from the south reached this area.

Venn Quarry

Examples of bedding styles characteristic of turbidite deposits

Photo VE10

Location 5812 3057

elevation 30m AOD

facing SE



Distal turbidites, thin graded beds of fine sandstone in shale, deposited some distance from the main source of the sediment.

Photo VE11

Location 5812 3057

elevation 30m AOD

facing SE



Proximal turbidites, thick sandstone beds with thin interbedded shales deposited closer to the main source of sediment.

2.5.5 Beam Quarry

General quarry view showing working faces.

PhotoBE 0

From SS 4709 2038

Elevation 25m AOD.

Facing West



The sandstones and shales exposed at Beam Quarry, Great Torrington belong to the geological division known as the Bude Formation which has a widespread outcrop in this area of north and central Devon.

The Bude Formation is Upper Carboniferous in age, in the sub-division known as the Westphalian, about 310 million years old.

The sequence is characteristic of the Bude Formation comprising beds of sandstone (known locally as 'gritstone' and these two terms may be considered interchangeable) separated by beds of mainly shale with some siltstones. The strata were originally laid down horizontally as sediments beneath the sea. In Westphalian times late in the Carboniferous it is likely that the sediment basin which had persisted in this area for a long time was becoming full and sedimentation was slowing down. The individual beds of greywacke sandstones, known as turbidites, were formed by intermittent high-density, sediment-laden underwater currents flowing down the basin slope into the deeper water. The coastline was to the north close to the present position of South Wales. The sharp folding was introduced later in the Carboniferous when the stress of the continental collision from the south reached this area.

Various sedimentary features characteristic of the Bude Formation greywacke-type of sedimentation are seen. Numerous load casts and other features characteristic of turbidite deposition are seen at the base of some sandstone beds along with plant debris on some bedding planes. These features are most evident in large loose blocks but examples of load casts can be seen in cross section in the faces where denser sandy sediment has pushed down in to the underlying soft mud shortly after deposition.

Beam Quarry

Syncline in gritstones and shales of the Bude Formation.

Photo BE1.

From SS 4693 2035

Elevation 36m AOD

Facing ENE



The well bedded strata at Beam are folded in a series of east to west trending upright anticlines and synclines which cause the sedimentary sequence to be repeated. The overall thickness seen is therefore relatively small, probably no more than a few tens of metres. However, this has the advantage that the same groups of rocks can be seen at several different locations in the working faces.

The photo shows the beds in the higher face dipping towards the camera whilst the beds in the lower face are seen to be dipping away with a sharp syncline axis along the line of the bench between. The beds on each side of the sharp folds in the working faces dip south and north at between 45° and 55° , though exceptionally slightly shallower or steeper.

At the top of the lower face and running along the intervening bench is a prominent bed of dark grey shale which is thicker than usual and is about midway in the quarry sequence. The sharp top of this shale in contact with the overlying sandstone beds is used at the quarry as a 'marker bed' to relate the geological structure and the operations. Because it is by far the thickest shale bed in the quarry it is readily evident wherever it occurs. It is characterised by having no obvious bedding. It appears to have formed as a result of severe disturbance of soft sediment soon after it was deposited, either by slumping under gravity or triggered by sudden shock such as an earthquake.