Stoke St Michael and Oakhill

Situated on the northern flank of the Beacon Hill Pericline, Stoke St Michael [29] [ST 66480 46842] is located on the narrow plateau of steeply dipping Carboniferous Limestone sandwiched between the higher ground formed by Devonian and Silurian rocks to the south (see Beacon Hill) and the younger Coal Measures exposed in the Nettlebridge Valley.

From the centre of Stoke St Michael, a walk down the valley to the north crosses the entire Carboniferous Limestone outcrop, part of which is very well exposed in old quarries.

A short distance down-valley, the stream cascades into Stoke Lane Slocker [30] [ST 66879 47400]. Accessible only to cavers, the stream can be followed through a flooded section to a series of large, well-decorated chambers. Cave divers have followed the stream for almost 2 km towards the resurgence at St Dunstan's Well [31] [ST 65883 47909]. Several other caves occur in the valley sides a few hundred metres farther north [32] [ST 66924 47514]. Significant numbers of bats, including the nationally rare greater and lesser horseshoe bats, hibernate in these caves.

The steeply dipping Carboniferous Limestone is visible through the trees in the privately owned Stoke Lane Quarry [33] [ST 66807 47408]. Here, thin soils support a species-rich limestone meadow that has never been treated with fertilisers or herbicides. The old pasture is at its best in summer, when many different species of herbs flower alongside grasses and sedges. Meadow oat-grass, sheep's-fescue and yellow oat-grass are common, along with glaucous and spring sedge. Orchids including the early purple orchid which flowers in late spring, followed in June by pale pink spikes of the common spotted orchid. Common rock-rose and wild thyme thrive here in the well-drained, warm soil, and a host of typical lime-loving herbs grow alongside including small scabious and field scabious, fairy flax, and salad burnet.

Formation of caves

Caves form by the dissolution of limestone. Rainwater picks up carbon dioxide from the air and as it percolates through the soil, it makes the rainwater a weak acid.This slowly dissolves out the limestone along the joints, bedding planes and fractures, some of which become enlarged enough to form caves. The largest caves form where water flows from the adjacent impermeable strata onto the limestone.The water sinks underground into holes known locally as 'swallets' or 'slockers'. Over time, the water finds new lower routes leaving some caves high and dry. Some of these have been dug out by cavers.The water reappears at the base of the limestone outcrop at large springs. These features are typical of a karst landscape.

Down valley, the footpath enters the disused Cooks Wood Quarry [34] [ST 66903 47895]. Dormant since 1989, this quarry offers an outstanding section through the upper part of the Carboniferous Clifton Down Limestone and the overlying Oxwich Head Limestone, which here dips at about 80° to the north.

The Clifton Down Limestone outcrops at the southern end of the eastern quarry and consists of about 200 m of massive and well-bedded crinoidal and oolitic limestone, with some carbonate mudstones and chert. Corals and brachiopods occur at some levels. The bulk of the quarry is in the overlying Oxwich Head Limestone. This consists of a cyclic series of well-bedded sandy limestone and softer mudstone units with some thin 'stringers' of coal that form prominent recesses in the cliff face. The coal and associated soil horizons developed during temporary periods of low sea level during the Carboniferous.

To the east, the scarp formed by the Quartzitic Sandstone runs through Hurdlestone Wood [35] [ST 67788 47985]. Here the rock gives rise to acidic, nutrient- poor soils, allowing greater woodrush to thrive, along with sessile oak, downy birch and alder, a highly unusual association in a Mendip woodland. Within this wood is the Hurdle Stone, a very large boulder of Quartzitic Sandstone, which is in a line with several smaller stones.

Farther east along the top of the scarp, on the lane from Ham to Leigh-upon-Mendip, is the disused Whitehole Quarry [36] [ST 68192 47925]. The rock exposed here is the Carboniferous Oxwich Head Limestone, as at Cooks Wood Quarry, a well-bedded sequence of crinoidal and oolitic limestone with some mudstone bands containing thin 'stringers' of coal.

The limestone is quite fossiliferous and large *Productus* brachiopods, coral and crinoid debris are present.

At the rear of the quarry is a prominent bedding plane with some conspicuous hollows. These have been interpreted as Carboniferous ‘tree boles’ originating at a time of low sea level when trees grew onthe emergent limestone surface. These hollows were formed by rain water flowing down the tree trunk and dissolving the limestone around the base of the tree.

At the foot of the scarp here, the footpath running along the south side of the River Mells crosses a fine example of a tufa cascade [37] [ST 67993 48251]. The water emerges from Whitehole Spring, a resurgence in Leigh Wood fed by a stream sink at Pitton Street about 800 m to the south. Whilst flowing underground, the water has become saturated with calcium carbonate (limestone). On emerging, the calcium carbonate is precipitated as tufa, a very porous, pale grey rock which covers the moss to form a series of dams known as gours. Farther east are Barnclose and Halecombe quarries [38] [ST 69960 47357]. Barnclose is a dormant quarry, which has not been worked since the 1970s, while Halecombe Quarry is still active. This quarry in Carboniferous Limestone produces materials for concrete aggregates together with a relatively small quantity of crushed stone for an on-site tar-coating plant. Production capacity is around a million tonnes of crushed stone annually.

Just over a kilometre north-west of Stoke St Michael is St Dunstan’s Well [31] [ST 65883 47909]. This spring is the major resurgence for most of the stream sinks (or ‘slockers’) in the area, and has a mean flow of about 150 litres per second. It occurs where a meander of Mells stream has eroded the impermeable Quartzitic Sandstone and Coal Measures, allowing the water in the limestone behind to drain out at river level along the line of the Withybrook Fault. The water from Stoke Lane Slocker [30] [ST 66879 47400] emerges here.

A short distance up the road is Fairy Cave Quarry [39] [ST 65679 47679]. Disused since 1977, this quarry is privately owned and access is only by arrangement. The quarry is developed mostly in the steeply dipping Clifton Down and Oxwich Head Limestone. Located just behind St Dunstan's Well, the quarry has intersected approximately 4.5 km of cave passage, of which about 0.8 km has been removed by quarrying. Two splendidly decorated cave systems are accessible to cavers. One of these caves is developed along the Withybrook Fault, which can be seen in the quarry, and is fed by water sinking at Withybrook Slocker [40] [ST 65527 47144].

The next valley to the west is Ashwick Grove [41] [ST 65036 47801]. This pleasant wooded valley was once part of the grounds of the now ruined Ashwick Grove, home to John Billingsley, a pioneer 18th century agricultural reformer. The Carboniferous Limestone forms bold crags along the valley sides. Three springs, with a combined flow of about 150 litres per second rise in the valley floor, partly fed by stream sinks to the south around Oakhill. The water from these springs once powered a mill, the remains of which can be seen at the bottom of the valley. From here, the footpath continues on into Harridge Wood and the Nettlebridge Valley. Alternatively, at the top of the valley, the Fosse Way can be followed up onto Beacon Hill.

Figures

(Figure 41) Aerial photograph of the Stoke St Michael and Oakhill area.

(Figure 42) Water sinking into the entrance of Stoke Lane Slocker, an extensive cave system.

(Figure 43) Schematic cross-section showing how cave systems develop.

(Figure 44) Green-winged orchid. © Sharon Pilkington.

(Figure 45) Steeply dipping limestone, Cooks Wood Quarry.

(Figure 46) Carboniferous ‘tree boles’ forming hollows on the surface of a bedding plane, Whitehole Quarry.

(Figure 47) Tufa cascades formed by the precipitation of calcium carbonate, encrusting moss, sticks and stones.

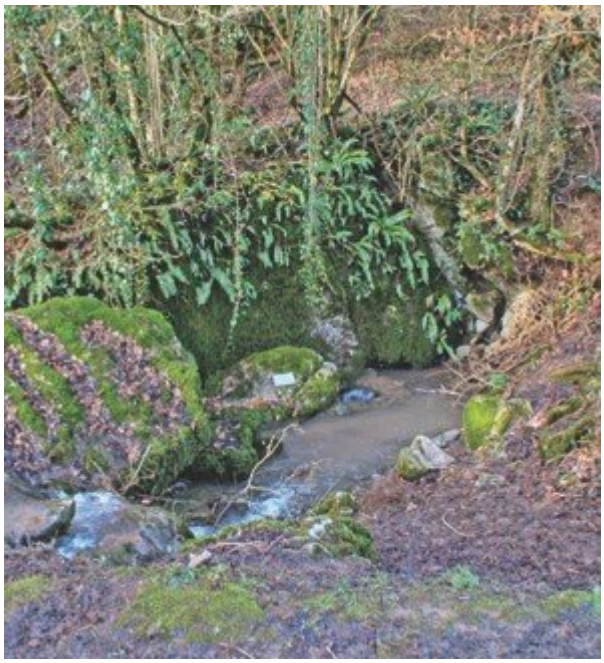
(Figure 48) The underground hydrology of the St Dunstan’s well system.

(Figure 49) A piped cave entrance, Fairy Cave Quarry. The quarry face to the left of the cave entrance is formed along the Withybrook Fault.

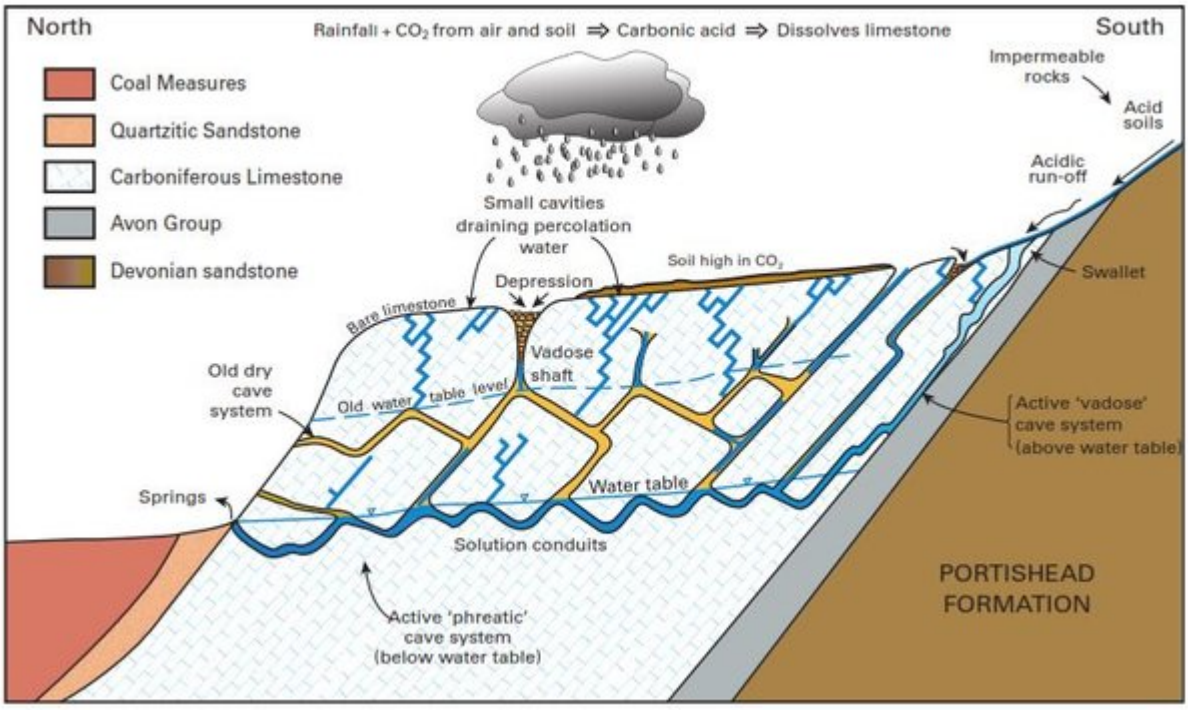
(Figure 50) Cross-section through the northern side of the Beacon Hill Pericline.

(Figure 51) Shatter Cave. © Peter Glanvill.

(Figure 41) Aerial photograph of the Stoke St Michael and Oakhill area.



(Figure 42) Water sinking into the entrance of Stoke Lane Slocker, an extensive cave system.



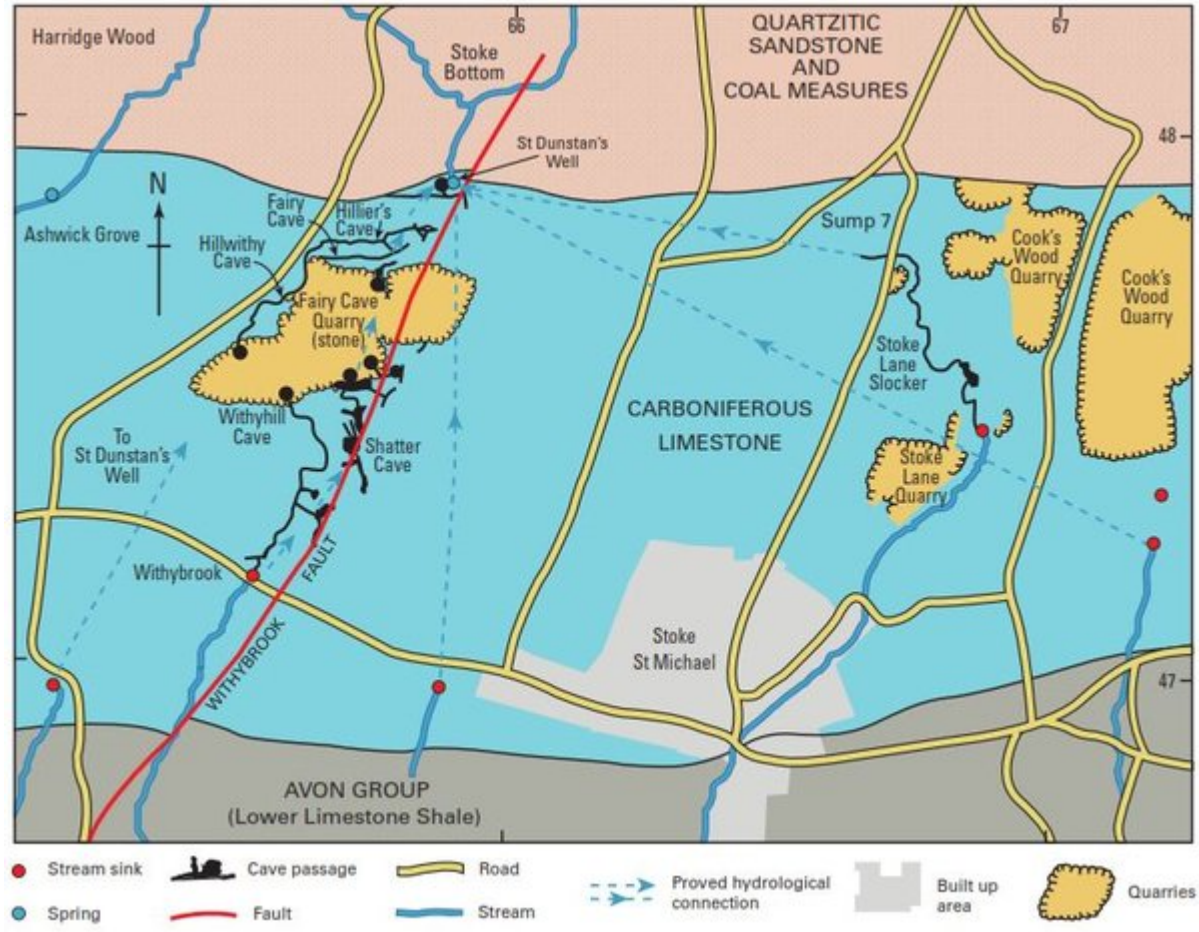
(Figure 43) Schematic cross-section showing how cave systems develop.

(Figure 44) Green-winged orchid. © Sharon Pilkington.

(Figure 45) Steeply dipping limestone, Cooks Wood Quarry.3

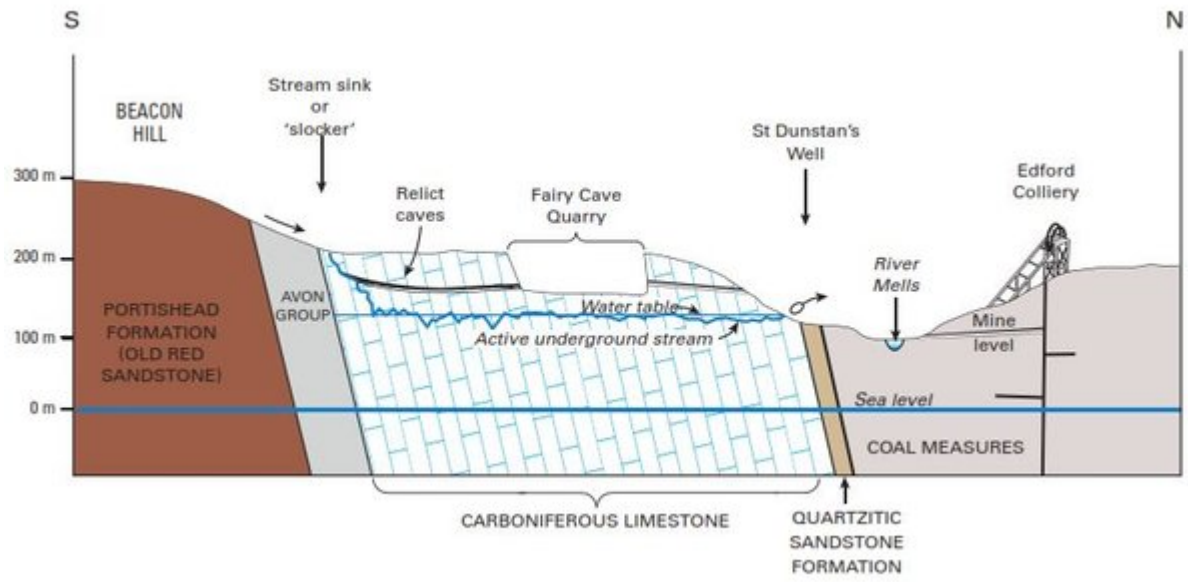
(Figure 46) Carboniferous ‘tree boles’ forming hollows on the surface of a bedding plane, Whitehole Quarry.

(Figure 47) Tufa cascades formed by the precipitation of calcium carbonate, encrusting moss, sticks and stones.

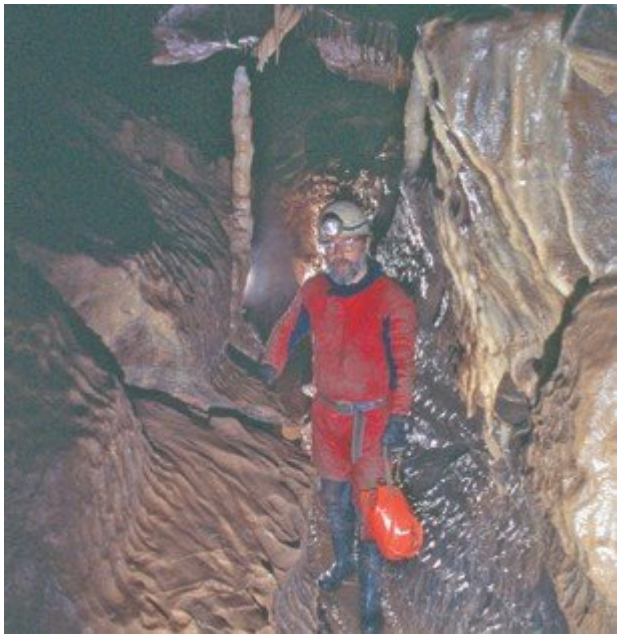


(Figure 48) The underground hydrology of the St Dunstan's well system.

(Figure 49) A piped cave entrance, Fairy Cave Quarry. The quarry face to the left of the cave entrance is formed along the Withybrook Fault.



(Figure 50) Cross-section through the northern side of the Beacon Hill Pericline.



(Figure 51) Shatter Cave. © Peter Glanvill.