

2.6. Variscan Igneous Rocks

Igneous rocks, both surface extrusions and sub-surface intrusions, are abundant throughout the Devonian and Carboniferous rocks of South Devon, often occurring in close association with the sedimentary rocks having formed usually at the same time or soon after. Interestingly, there are few of these rocks in North Devon. The rocks are usually varieties of basic igneous rocks such as basalts and dolerites (commonly called 'greenstones') in the form of lava flows with associated tuffs or as minor intrusions such as dykes and sills. Nevertheless, some deposits are sufficiently large to have been quarried as aggregates and the quality for this purpose is generally good.

There are two active quarries in the igneous rocks, Trusham and Whitecleaves Quarries. In addition, Meldon Quarry, considered above, includes basic igneous rocks in its diverse range of rock types

The Dartmoor Granite is also an igneous rock which was intruded on a massive scale at the end of the Variscan Orogeny but it is not considered in this account because it has not been quarried to any significant extent for use as aggregates.

2.6.1 Trusham Quarry

View of Dolerite/Slate Contact

Photo TR 02a

From SX 8484 8090

Facing West



A dolerite sill intruded in shales of the Lower Carboniferous Combe Shale Formation is worked at Trusham Quarry near Chudleigh. The photo shows a view of the Dolerite/Combe Shale contact. The upper contact of the sill with dark blue/grey Combe Shale dips at around 50° towards the left side with the dolerite in the lower part of the face in the midground. A variable depth of surface related weathering affects the sill and the associated shales in places.

Three dolerite sills occur in the vicinity of Trusham Quarry (and the nearby Crockham Quarry) outcropping parallel to the bedding folded around the Whetcombe Anticline and other folds of the Trusham fold series. The sills are demonstrated to be conformable with the shale and are believed to have been intruded soon after the shales were deposited.

2.6.2 Whitecleaves Quarry

General view of quarry faces, upper faces restored to rocky habitat

Photo WC03h From SX 7371 6559 Facing East



A purplish-grey variety of basalt known as a spilite is worked at Whitecleaves Quarry, Buckfastleigh. The rock is a moderately-fresh to fresh basic igneous rock of Devonian age occurring in close association with mid Devonian slates, tuffs and limestones and with the Gurrington Slates of late Devonian age. Exact relationships are not clear but some contacts are steeply dipping are some of these are likely to be thrust boundaries formed by compression during the continental collision of the Variscan orogeny

The intrusion is believed to have formed at about the same time as the associated sediments. The Whitecleaves deposit is similar to many other 'greenstones' in southwest England which are believed from their geochemical characteristics to have originated deep in the earth's mantle. A spilite is usually characterised by a relatively high sodium content, believed to result from contact with sea water.

The deposit at Whitecleaves Quarry is quite heavily mineralised with specular haematite disseminated throughout the igneous body. Vein mineralisation is also common, typically displaying brecciation of the host rock within the vein. Mineralisation is frequently associated, comprising quartz and platy specular haematite. The vein breccias probably represent late stage hydrothermal events formed during or shortly after the igneous intrusion (see overleaf).

Unlike many other basic igneous deposits in south west England, surface related weathering is insignificant as can be seen in the photo. This suggests that the Whitecleaves deposit was concealed at the time when much of this weathering occurred.

Whitecleaves Quarry Detail of vein breccia

Photo WC06a

SX 7377 6562

Facing North



Detail of angular igneous rock “floaters” in quartz veining formed in late stage hydrothermal activity.

Whitecleaves Quarry Detail of vesicular rock incorporated within later dolerite

Photo WC03k

SX 7371 6559

From loose block



Evidence for two types of ‘greenstone’, the normal purplish-grey massive dolerite incorporating a fragment of an earlier dark greenish-grey rock which seems to contain the mineral chlorite and numerous vesicles or steam holes.