

### 5.3 Meldon Quarry

**Highlights**

- Exposures of lithium-rich albite microgranite.
- Examples of silicate and sulphide-rich skarn mineralisation.
- Locality for tin-bearing silicate, malayite.

**Geographical Coordinates** 50°42'35.7"N, 4°01'51.4"W **OS Grid Reference** SX 567 920

**Access** Hazards include marshy ground, uneven ground, fast-flowing water and steep quarry faces, in places with loose rock and soil material.

**Distance to walk** 0.9 miles (1.5 km) **Elevation changes** 100 m **Time** 1 ½ hours

**Conservation status** Both the aplite quarry and Red-a-Ven mine are SSSI and within the Dartmoor National Park. No hammering or collection of specimens without a licence.



**Figure. 5.6** Location map for Meldon Quarry. © Crown Copyright/database right 2014. An Ordnance Survey / EDINA supplied service.

#### Directions

The site is situated 3 km to the SW of Okehampton and is reached via a minor road leading off the B3260 opposite Betty Cottle’s Inn [SX 566 935]. Pass beneath the former London and South-Western Railway viaduct and then park in the area to the right of the road. The quarry is divided into two bays by the Red-a-Ven Brook, which flows towards the west.

The excursion will visit both bays of the aplite quarry, now disused and also the remains of Red-a-Ven or Meldon Mine, which lies some 350 m upstream to the SE. To the east of the aplite quarry is the site of the very large Meldon Railway Quarry, which formerly worked railway ballast from Carboniferous hornfels and metabasites – this quarry is now closed and not available for visits.

#### Geology

The geology of the area around Meldon is described in the Geological Survey Memoir for Sheet 324 (England and Wales) (Edmonds and others, 1968) and this account will, essentially, follow the terminology used in that publication. In essence, the strata of the district include metasediments of Upper Devonian age, a condensed sequence of metasediments with metabasites (volcanic and intrusive) of Lower Carboniferous

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age and metasediments of the lowest part of the Upper Carboniferous Culm Measures. The stratigraphy is shown in Table 6.1.

**Table 6.1. Stratigraphy of the Meldon area**

Age	Stratigraphic unit	Estimated thickness (m)
Late Carboniferous (Namurian)	Crackington Fm	>500
Carboniferous (Visean/Namurian)	Ashton Shale Member	40
Early Carboniferous (Visean)	Meldon Chert Formation	72
Early Carboniferous (Tournaisian)	Meldon Shale and Quartzite Formation (with Meldon Volcanic beds)	130
Late Devonian to Early Carboniferous (Famennian to Tournaisian)	Meldon Slate-with-lenticles Formation	120 (seen)

The western bay of the Meldon Aplite Quarry (Figure 5.7a) is in host rocks of the Lower Carboniferous Meldon Shale and Quartzite Formation, essentially dark grey and black mudrocks altered by thermal metamorphism to hornfels (metapelites). These rocks are locally rich in sulphides, including pyrrhotite, and are interbedded with thin siltstone

horizons. The western face shows a dyke of leucocratic microgranite, some 20 m wide and dipping towards the south at about 70°. This rock is the 'Meldon Aplite' and consists of an equigranular, saccharoidal, fine-grained rock consisting essentially of albite, quartz and lithium-rich micas, including protolithionite and lepidolite (Figures 5.7b, c, d). Accessory minerals include purple fluorite, apatite and tourmaline in green and pink coloured varieties.

Petalite, columbite and a range of other minerals exotic in SW England have also been recorded (Edmonds and others, 1968). Although now obscured by lichen and weathering, contact pegmatites, with curved feldspar crystals were formerly observed at this site.

In the eastern bay of the quarry, apophyses of the Meldon Aplite can be seen penetrating the bedding of the host Meldon Chert Formation, in the southern face dipping northwards at about 30°. In this vicinity, green tourmaline and apatite are common accessory minerals in the aplite (Figure 5.7e), and axinite is commonly developed along the aplite/chert contacts.

Travelling upstream to Red-a-Ven Mine (Figure 5.7f), also within the Meldon Chert Formation, waste dumps at the site show silicate skarn assemblages including wollastonite, garnet and hedenbergite, together with idocrase and the rare tin silicate mineral malayite (El Sharkawi and Dearman, 1966). There are also examples of sulphide-rich skarns with

pyrrhotite-chalcopryrite-löllingite assemblages (Figure 5.7g). The outcrop of the sulphide skarn can be seen as a horizon about 0.8 m wide in the bed of the Red-a-Ven Brook.

The Meldon Chert Formation is composed of thin beds of grey chert, interbedded with brown-grey mudstone, which is commonly carbonate-rich. Beds of impure limestone occur in places, also beds of black sulphidic shale. In the Meldon area, the chert formation is affected by thermal metamorphism, and there is local alteration to calc-silicate assemblages, including wollastonite, garnet, pyroxene and idocrase (Figure 5.7h): there are also minor occurrences of Mn silicates including rhodonite and tephroite.

## Literature

- Edmonds, E A, Wright, J E, Beer, K E, Hawkes, J R, Williams, M, Freshney, E C, & Fenning, P J. 1968. The geology of the country around Okehampton. Memoir of the Geological Survey of Great Britain; Sheet 324 (England & Wales).
- El Sharkawi, M.A.H. and Dearman, W.R., 1966. Tin-bearing skarns from the north-west border of the Dartmoor Granite, Devonshire, England. *Economic Geology*, 61, 362-369





**Figure 5.7** (a) West bay of Meldon Aplite Quarry, with southward dipping microgranite dyke emplaced in hornfels of the Meldon Shale and Quartzite Formation. (b) Equigranular microgranite of the Meldon Aplite (quartz-albite-Li mica). (c) Hangingwall contact between aplite dyke (below) and Meldon Shale and Quartzite Formation (above). (d) Texture of coarser-grained Meldon Aplite (quartz-albite-Li mica). (e) East bay of Meldon Aplite Quarry – green tourmaline in coarser-grained aplite. (f) Site of Red-a-Ven Mine, with bedrock of Meldon Chert Formation.





**Figure 5.7** continued **(g)** Sulphide skarn from Red-a-Ven Mine with pyrrhotite, löllingite, chalcopyrite and minor malayite. **(h)** Calc-silicate skarn *in situ* in Meldon Quarry drainage adit. The assemblage is wollastonite-garnet-hedenbergite-idocrase with minor rhodonite.