5.6 Blackingstone Rock / Blackenstone Quarry

Highlights
- Large granite tor with well-developed joints.
- Exposures of coarse-grained porphyritic biotite granite.

Geographical Coordinates 50°39126.2”N3°43’06.6”W **OS Grid Reference** SX 7865 8560

Access Moorland site with steep climb and steps to summit of Tor. Hazards include uneven ground and steep rock faces, with vertical drops from the summit of Blackingstone Rock, and flooded open workings at Blackenstone Quarry. In summer, the vegetation is high with much bracken: there is a particular risk of tick bites and the associated risk of contracting Lyme Disease. It is sensible to avoid wearing shorts at this locality and to make use of suitable insect repellents.

Distance to walk 0.9 miles (1.4 km) **Elevation changes** 70 m (230 ft) **Time** 1 ½ - 2 hours

Conservation status National Park – No hammering, drilling or sample collection.

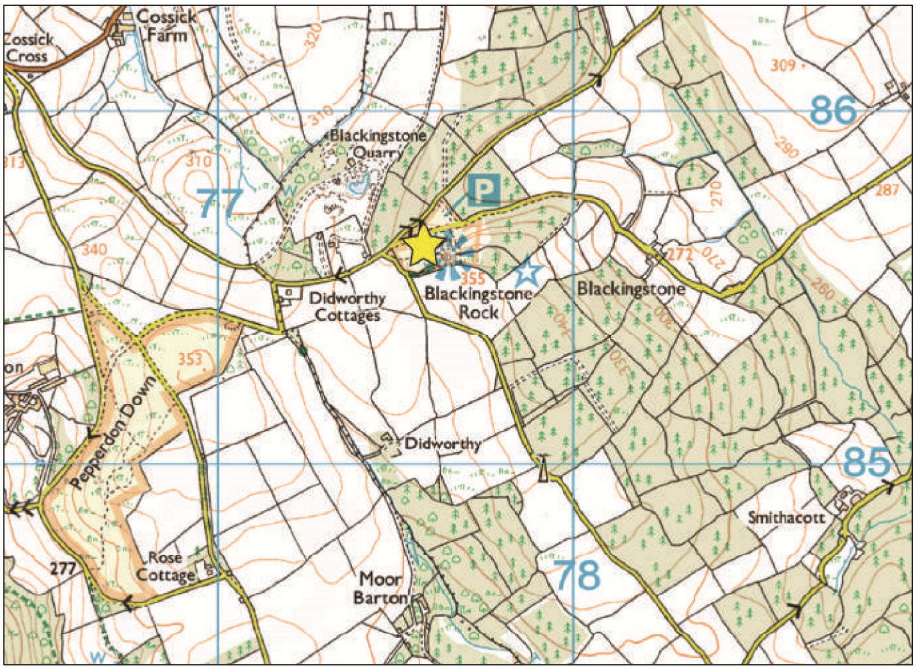

Figure. 5.12. Location map for Blackingstone Rock / Blackenstone Quarry. © Crown Copyright/database right 2014. An Ordnance Survey / EDINA supplied service.

Directions

Travelling from Exeter, the site is approached via the B 3212 road to Moretonhampstead, turning off at Cossick Cross [SX 775 861] and travelling south-eastwards on the minor road towards Bridford. Blackingstone Rock forms a prominent tor (Plate BR1), which affords good exposures of the typical coarse-grained megacrystic biotite granite of northern Dartmoor. From the summit, there are excellent views southwards towards Haytor and westwards to central Dartmoor. There will also be an opportunity to visit Blackenstone Quarry [SX 784 858] some 300m to the NW, which was an important source of local building stone. Although the main quarry is now disused and flooded, the waste dumps are still worked and show good examples of fresh material.

Geology

The coarse biotite granite at Blackingstone Rock has a matrix of quartz, K-feldspar, plagioclase and biotite, enclosing perthite megacrysts ranging from 20 to 120 mm, with a mean length of about 60 mm. The megacrysts commonly show preferred orientation (Figure 5.13a), which changes direction over relatively short distances. The abundance of megacrysts measured at the tor is about 16 volume %, and at the quarry is 9.5 volume % (Hawkes, in Selwood and others, 1984). Muscovite is a minor mineral phase: in thin section it appears to be a secondary mineral replacing biotite or plagioclase. Quartz-tourmaline aggregates are common throughout the granite, and range up to about 70 mm across. These irregular bodies are clearly replacing the host granite and many appear to have nucleated preferentially within the feldspar megacrysts (Figure 5.13b). The widespread presence of these tourmaline aggregates not only at these localities but throughout NE Dartmoor reflect high levels of boron in the magma and its late-stage concentration in the magmatic/hydrothermal transition.

In terms of geochronology, the 14 sample whole-rock Rb/Sr isochron published in Darbyshire and Shepherd (1985) gives an age of 280 +/- 1 Ma and includes material from Blackenstone Quarry. More recently, Chesley and others (1993) have provided a U/Pb monazite age of 280.4 +/- 1.2 Ma for the granite at Haytor Quarry, to the south of Blackingstone Rock. A similar date is recorded for skarn mineralisation at Haytor Iron Mine using the Ar/Ar technique on amphibole.

A prominent feature of Blackingstone Rock is the jointing, of which there are three main sets, one flat-lying, with gently curving surfaces (Figure 5.13c): these were referred to by some of the earlier authors as 'pseudo-bedding'. The other sets are roughly NNW-SSE and vertical or subvertical, and a weaker set, also nearly vertical and striking NE-SW to E-W. The surface of the summit at Blackingstone Rock is noteworthy for the presence of 'rock basins', hollows up to 1 m or more across. Some early writers ascribed these to the activities of the Druids, but a more likely explanation is long term weathering in the periglacial conditions of the Ice Ages.

Literature

Chesley, J. T., Halliday, A. N., Snee, L. W., Mezger, K., Shepherd, T. J. & Scrivener, R. C. 1993. Thermochronology of the Cornubian batholith in southwest England: implications for pluton emplacement and protracted hydrothermal mineralisation. Geochimica et Cosmochimica Acta, 57, 1817-1835.

Darbyshire, D. P. F. & Shepherd, T. J. 1985. Chronology of granite magmatism and associated mineralization, SW England. Journal of the Geological Society of London. 142, 1159-1177.

Selwood, E B, Edwards, R A, Simpson, S, Chesher, J A, Hamblin, R J O, Henson, M R, Riddolls, B W, & Waters, R A. 1984. Geology of the country around Newton Abbot. Memoir of the British Geological Survey, Sheet 339 (England and Wales)

Figure 5.13 (a) Coarse megacrystic granite on the eastern face of Blackingstone rock, showing the preferred orientation of feldspar crystals. Photo G Warrington. **(b)** Detail of coarse megacrystic granite at Blackenstone Quarry, showing a quartz-tourmaline aggregate replacing K-feldspar. Photo R. Scrivener **(c)** Blackingstone rock looking towards the south - note the prominent set of flat lying joints. Photo R.Scrivener.