
High Down Quarry, Devon

[SS 653 290]

Introduction

The High Down Quarry GCR site, at Filleigh, near South Molton, in Devon, is the type locality of the aluminum phosphate mineral wavellite. This small quarry is situated directly to the north of the minor road between West Buckland and Heddon.

There is considerable interest in the naming of this mineral. The original paper on wavellite was by Davy (1805). The paper was entitled '*An Account of Some Analytical Experiments on a Mineral Production from Devonshire*'; it also stated that a Dr Babington proposed to call the 'fossil' from Devonshire 'wavelike', after Dr William Wavell, the gentleman who discovered it (note, in the original paper 'Wavel' is spelt with one l). An earlier discovery, some time before 1785, by a Mr I. Hill, has been suggested by Sowerby (1811).

A specimen of wavellite from High Down Quarry was figured by Sowerby (1806) in his *British Mineralogy*, and listed in Greg and Lettsom (1858). An annotated colour photograph of an excellent specimen of wavellite from High Down Quarry was in Embrey and Symes (1987). Because of its radiating fibrous appearance wavellite was originally thought to be a zeolite, and was known for sometime as 'hydrargillite', and also for a short time as 'devonite'. An excellent description of the discovery of the Barnstaple zeolite (wavellite) has recently been given by Clevely (2007).

Description

Today it is hard to determine the reason why the quarry was worked, perhaps for material for wall construction for local fields or it may have simply acted as a cattle containment area. The low quarry faces (maximum depth of approximately 3 m) (see (Figure 7.57)) expose black carbonaceous cherty slates of the Codden Hill Beds (Carboniferous, Lower Culm), with wavellite crystals sparingly present along cleavage and joints.

Wavelike appears to be restricted to the southern end of the quarry working, and becomes hard to find in the northern exposures of slate. Fine specimens can still be collected from small dumps on the quarry floor. The wavellite occurs as colourless, white-grey, or light-green acicular crystals forming flat radiating or spherulitic aggregates (average 1 cm in diameter) coating joints or fractures (cleavage planes) in the slates. Exceptional specimens have been described as botryoidal masses of radiating crystals (see (Figure 7.58)) up to 5 cm in diameter, pale-green in colour, and sometimes blackened by carbonaceous inclusions. The rhomboidal jointing in the black slate is sometimes bleached where mineralization occurs. A further aluminium phosphate mineral, variscite, is sometimes intimately associated with the wavellite. Variscite typically occurs as very small aggregates (hemispherical or globular) associated with wavelike or as thin coatings along cleavage surfaces. The same association of wavellite and variscite is seen in beds of similar age on the Gower Peninsula, in South Wales (Bevins, 1994; Plant and Jones, 2001).

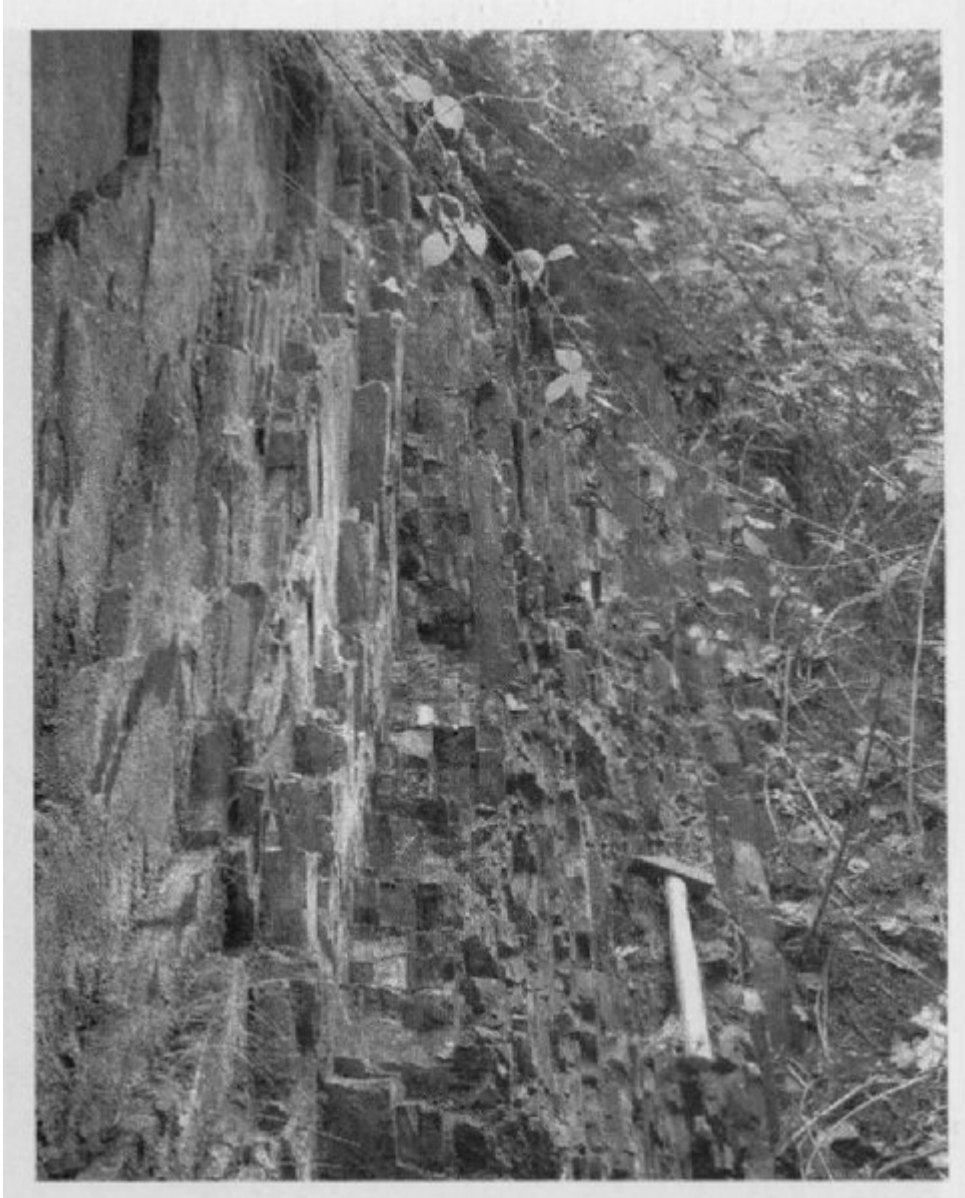
Interpretation

There are no other mineral deposits in the immediate vicinity of High Down, and there is general agreement that at High Down Quarry wavellite is of supergene or secondary origin, although worldwide it has been described as coating joint-surfaces and sometimes in cavities in low-grade metamorphic rocks, and rarely has been recorded as a late-stage mineral in some hydrothermal veins. The wavellite (and variscite) could have formed from the reaction between aluminous clay-minerals (kaolinite) and phosphorus-bearing waters. The source of phosphorus could have been apatite disseminated throughout the country rocks.

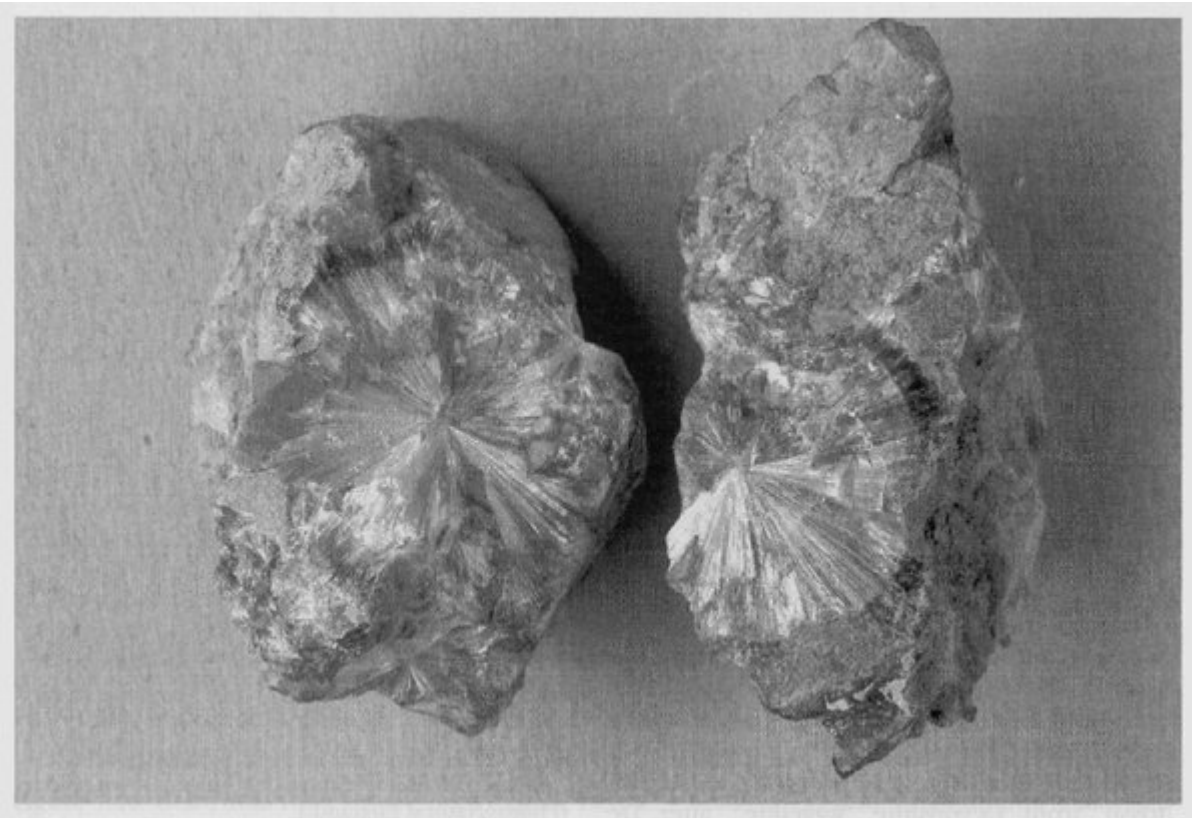
Conclusions

High Down Quarry is the type locality for the aluminium phosphate mineral wavellite, where mineralization can still be seen *in situ* and collected for study from small waste heaps. It occurs with the aluminium phosphate variscite.

References



(Figure 7.57) Black carbonaceous cherty shales of the Codden Hill Beds, exposed at High Down Quarry (Photo: Natural England.)



(Figure 7.58) Wavelike specimen from High Down Quarry (Photo: Natural England.)