

*Notes on the occurrence of wulfenite at Brandy Gill,
Cumberland, and of leadhillite at Drumruck mine,
Kirkcudbrightshire.*

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Wulfenite from Cumberland.

IN OCTOBER 1875 the late J. G. Goodchild¹ recorded his then recent discovery of a mineral which he stated 'he believed' to be wulfenite and which he had found on an old mine dump near Carrock Fell, Troutbeck, Cumberland. One specimen only was, I believe, found by Mr. Goodchild, and this he presented to the Carlisle Museum, where it has been seen by myself, the label bearing the more precise locality of Brandy Gill.

Wulfenite is an extremely rare mineral in the British Isles, being known only as minute crystals from two other localities,² namely, Higher Pitts mine, Mendip Hills, Somersetshire, and Lauchentyre mine, Gatehouse of Fleet, Kirkcudbrightshire. In the company of Mr. Percy Blight I endeavoured during the last summer to verify Mr. Goodchild's observation and we were successful in re-locating the spot and in collecting a number of specimens of the mineral in question. These accord with Mr. Goodchild's brief description and exactly resemble the Carlisle Museum specimen. The wulfenite occurs as small—not exceeding $1\frac{1}{2}$ mm. in diameter—honey-yellow, extremely thin platy crystals, flattened parallel to c (001) and often nearly circular in outline, with a marked tendency to form rosette-like aggregates, and also as irregular outlined scales. No measurable crystals were observed. It is usually intimately associated with, or implanted on, small, bright green to yellowish-green, tapering prismatic crystals of pyromorphite; or rests directly on drusy-faced,

¹ J. G. Goodchild, Wulfenite at 'Caldbeck Fell'. Geol. Mag., London, 1875, dec. 2, vol. 2, pp. 565-566; also Trans. Cumberland and Westmorland Assoc. Adv. Lit. Sci., 1885, no. 9 (for 1883-1884), p. 188.

² L. J. Spencer, Min. Mag., 1923, vol. 20, p. 88.

more or less iron-stained quartz, with which are associated small quantities of galena, cerussite, and chalcopyrite. Anglesite, noted by Mr. Goodchild as an associate, was not observed. The mineral is optically negative and gives the characteristic micro-chemical tests for lead and molybdenum.

The exact spot where the mineral occurs is a small dump derived from a trial level, three-quarters of the way up Brandy Gill, a tributary of Grains Gill, and at the confluence of which gills half a mile to the south, the Carrock wolfram-scheelite mine was worked, while half a mile to the north is Dry Gill mine, the well-known locality for campylite (six-inch Ordnance sheet, Cumberland 47 SE.). The level, the mouth of which has long since been obliterated, was apparently driven between the years 1864-1870 by Messrs. Leicester, Hutchinson and Co. with a view to exploring an east and west lead-bearing vein traversing a rotten granophyre and situated between the northern extensions of the north and south Emerson and Harding veins of the Carrock wolfram mine, both of which farther south carry, among other minerals, molybdenite. Another level has been driven a short distance down Brandy Gill, apparently on the same vein, but the dump shows no trace of wulfenite, and the mineral appears to have been of extremely local occurrence.

Leadhillite from Kirkcudbrightshire.

In 1917 I had occasion to visit the small copper mine of Drumruck, situated about five miles north of Gatehouse of Fleet, Kirkcudbrightshire (six-inch Ordnance sheet, Kirkcudbrightshire 41 NW.). The mine had been started by the owner of the property, the late Colonel Murray Baillie of Callay, at the beginning of 1913, and four levels had been driven in the hill-side on a small and most unpromising vein containing an occasional string of chalcopyrite in quartz, the enclosing rock being Ordovician slate traversed by a felsite dike. The vein-stuff from the upper level contained a very small quantity of alteration products of chalcopyrite and galena, and amongst these I found a single specimen of leadhillite. The specimen consists mainly of cavernous galena in part altered to cerussite with very minute crystals of yellow pyromorphite, a trace of linarite, and a good deal of chrysocolla, with some malachite and quartz, the cavities being occupied by small crystals of cerussite and larger crystals of leadhillite.

The leadhillite crystals, one of which was measured on the goniometer, are white and translucent, and range up to 5 mm. in diameter. They are for the most part superimposed and are of the typical six-sided habit, tabular parallel to $c(001)$ which possesses the characteristic pearly lustre, and are bounded by $a(100)$, $m(110)$ with sometimes well-defined $x(111)$.¹

¹ Letters and indices as in Dana, System of Mineralogy, 6th edit., 1892.
