

Notes on the occurrence of Dundasite in Derbyshire and Co. Galway.

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AN occurrence of the rare mineral dundasite (hydrrous carbonate of lead and aluminium) at the Welsh Foxdale mine, Trefriw, Carnarvonshire, was described by Dr. G. T. Prior in 1906.¹ Since then the mineral has been found by the writer at two additional localities in the United Kingdom. Certain specimens collected in 1910 at the well-known Mill Close mine, Wensley, Derbyshire, show a mineral which examination has proved to be dundasite. It occurs here as minute white or yellow spheres, not exceeding $\frac{3}{4}$ mm. in diameter, the exterior smooth and waxy, the interior radiating and silky. The spheres are implanted on small colourless cubes of fluor, or sprinkled over the surface of a dense grey chert, and are associated with small colourless twinned crystals of cerussite, indistinctly crystallized brown calamine ($ZnCO_3$), small black crystals of blende, and galena. A bright canary-yellow crust of greenockite coats all these minerals, making the specimens conspicuous. The specific gravity, optical and chemical characters, agree closely with those of the dundasite from the Welsh Foxdale mine. The mineral is decomposed by strong sulphuric acid with the liberation of carbon dioxide. The presence of aluminium was detected by the microchemical reaction with caesium-alum.

The occurrence of good specimens of the earthy variety of greenockite is interesting, the only other locality in the British Isles where the mineral occurs in this form being the Wanlockhead mines, Dumfriesshire. There is a specimen from here in the British Museum (Natural History), presented by Patrick Dudgeon in 1886, showing greenockite associated with blende and hemimorphite. At the other British locality, namely, Bishopton tunnel, Erskine, Renfrewshire, the mineral is invariably crystallized.

Mill Close mine is worked for lead and zinc, the vein lying between

¹ G. T. Prior, 'Dundasite from North Wales.' *Mineralogical Magazine*, 1906, vol. xiv, pp. 167-169.

limestone-shale and dolerite (toadstone). At the present time it is by far the most productive, besides being one of the oldest mines in Derbyshire. In addition to those already mentioned, the following minerals occur there:¹ Galena occasionally as cubes 2 inches along the side; marcasite as large balls with a bright platy exterior; calcite as scale-nohedra occasionally measuring a foot along the vertical axis; fluor as colourless or slightly yellowish cubes, often showing included layers of marcasite; barytes in coral-like form of a white or brown colour (locally known as 'brain-stone') composed of small elongated wedge-shaped crystals.

During the summer of 1908 I visited the then newly opened Clements lead mine, which is situated on a westerly arm of Lough Corrib in the townland of Carrowgarriff, near Maam, Co. Galway. Mining was then being carried on by means of an open-cut on a rich north and south lead lode traversing slaty rocks. With the exception of a few specimens of dundasite here described, there was little of interest to the mineralogist.

The dundasite here occurs in two distinct forms. Usually as minute snow-white silky balls or flattened spheres, which are sprinkled over a mass of silky black slate, and are associated with a little acicular cerussite, allophane, quartz, pyrite, and limonite. Under the microscope the balls are seen to be either smooth on the exterior or to consist of divergent needles. In the other and rarer variety the dundasite forms snow-white loosely aggregated needles (resembling fine down) occupying cavities in a vein-stuff consisting of quartz, galena, blende, calcite, and silky slate, associated with which are a few small crystals of pyrite and acicular cerussite. The specific gravity of the balls was found to be about 8.25; both varieties agree in chemical and optical characters with the species dundasite. The association with allophane and cerussite recalls the occurrence at the Welsh Foxdale mine, Carnarvonshire. The allophane forms small glassy spherules, either white, or brown from admixed limonite; its specific gravity is about 1.87.

¹ C. E. Parsons, 'The deposit at the Mill Close lead mine, Darley Dale, Matlock.' *Trans. Fed. Inst. Mining Engineers*, 1896, vol. xii, p. 115.