Baryte crystals from the Manvers Main colliery, Wath-upon-Dearne, near Rotherham, Yorkshire.

By Arthur Russell.

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EARLY in the summer of 1930 there was exposed in the Parkgate Seam, No. 3 Pit of the Manvers Main colliery, Wath-upon-Dearne, near Rotherham, Yorkshire, a large cavity lined with exceedingly beautiful crystals of baryte; this being the first occurrence of the kind recorded in the south Yorkshire coalfield. The cavity was quickly more or less completely wrecked by the miners, when fortunately my friend, Mr. C. P. Finn, the Company's chemist, had his attention drawn to the matter, and as a result some brief notes on the occurrence, accompanied by a photograph of a specimen, were published by him.[1] Thanks to the efforts of Mr. Finn, and as the result of visits to the colliery, I was able to obtain some very fine and interesting specimens of the mineral.

The cavity was in a compact grey sandstone, directly overlying the Parkgate Seam, and apparently occupied a small fault. Its dimensions as ascertained by Mr. Finn were 5 yards in length, 5 yards in height, and from 12 to 15 inches wide at the base, tapering to nothing at the apex, and it was discovered only by the falling away of the sandstone roof.

The baryte crystals, which are colourless and more or less transparent, are of two distinct types, prismatic and tabular, the occurrence of the two habits in the same cavity being somewhat remarkable. They are attached to small cream-coloured rhombohedra of dolomite, which form a coating on the sandstone, both baryte and dolomite being for the most part more or less thickly sprinkled with small, up to $2\frac{1}{2}$ mm., bright twinned crystals of chalcopyrite which enhance the beauty of these remarkable specimens. In Mr. Finn's notes these crystals of chalcopyrite were in error called pyrite. The prismatic

[1] C. P. Finn, An occurrence of barytes in the Parkgate (south Yorkshire) seam. Trans. Inst. Mining Engineers, 1930, vol. 80, pp. 25–26; and Trans. Midland Inst. Mining Engineers, vol. 31.

crystals also sometimes contain minute included crystals of chalcopyrite, and on the dolomite there are rarely one or two minute aggregates of bright octahedra of galena, and still more rarely minute crystals of blende.

Crystals of baryte of both habits were measured on the goniometer. The prismatic crystals (fig. 1), which are sometimes doubly terminated, attain a length of 7 cm.; and those of the tabular habit (fig. 2), which

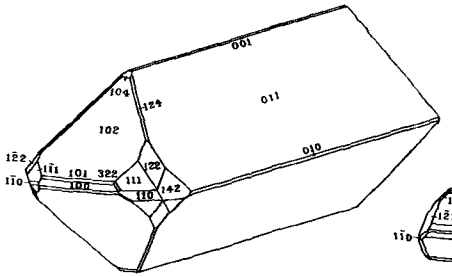

FIG. 1.

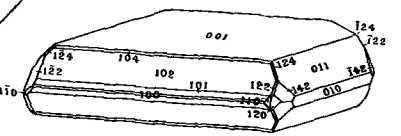

FIG. 2.

Baryte crystals from the Manvers Main Colliery, Yorkshire.

are often nearly square in outline, measure 5 cm. along the edge. The following forms [1] were observed:

a (100), *b* (010), *c* (001), *m* (110), *n* (120),
ψ (1.0.20), *l* (104), *g* (103), *d* (102), *u* (101), *D* (302), *o* (011),
z (111), μ (124), *y* (122), ξ (142), γ_l (322).

The forms (120), (1.0.20), (103), and (302) are present only on the crystals of the tabular habit, and, with the exception of (120), they are represented only by very narrow faces. On the drawing of the tabular crystal (fig. 2) the very narrow faces of (103) and (302), as also a minute face of (111), are not shown.

ψ (1.0.20), as repeated faces oscillating with (001), lies in the zone [*au*] and gave a measured angle to (001) of 4° 33½′ (calculated 4° 36½′). This was noted as a vicinal face by J. Valentin in 1899 on baryte from Kronthal, Alsace.

γ_l (322), present only on the crystals of prismatic habit, lies in the zones [*ao*] and [*dm*] and gave a measured angle to (100) of 34° 19′ (calculated 34° 20′). This form, first observed by Sir Henry A. Miers in 1883 on baryte from Chirbury, Shropshire (Nature, London, vol. 29,

[1] Axes of reference ($a : b : c = 0{\cdot}8152 : 1 : 1{\cdot}3136$) and letters as in Dana, System of Mineralogy, 6th edit., 1892, and V. Goldschmidt, Atlas der Krystallformen, 1913, vol. 1.

pp. 29, 124), has been listed as doubtful. I have found it on many crystals from that locality.

The prominent faces of the prismatic crystals often have a somewhat frosted appearance; and in general habit, and more particularly from the presence of the characteristic forms (142) and (322), the crystals resemble those from Wotherton mine, Chirbury, Shropshire.

Mr. Finn's analysis of a transparent crystal gave $BaSO_4$ 98·50, $CaSO_4$ 0·65, $SrSO_4$ 0·18, loss on ignition 0·33 %; specific gravity 4·5.