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Note on Calcite from the Chalk at Corfe Castle, Dorset.

By H. L. Bowman, M.A., D.Sc.
Professor of Mineralogy in the University of Oxford.

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SOME specimens of calcite which I obtained recently from a chalk-pit at Corfe Castle in Dorsetshire appear worthy of description on account of their somewhat unusual habit and of the rarity of well-crystallized minerals in the Chalk.

The pit is situated in the Upper Chalk, not far from the great overthrust fault which traverses the Isle of Purbeck from west to east along the boundary of the Chalk and the overlying Tertiary beds. The Chalk is here steeply inclined, with a northerly dip, and is much indurated, being sufficiently hard to be worked for road-metal. The hardness is attributed by Strahan[2] to a crushing of the rock in the neighbourhood of the fault and subsequent re-cementing by carbonate of lime. An analysis of the hard chalk of this locality by Duvillier[3] shows: $CaCO_3$, 98·17; $MgCO_3$, 0·74; phosphate of lime, 0·26; oxide of iron, 0·28; soluble silica, 0·10; clay, 0·42 per cent.

The crystals occur in small veins partly filled with red clay with which they are often stained on the surface though clear and colourless within. They are usually about $\frac{1}{2}$ in. in diameter, but some attain a size of 1 in. in diameter by $1\frac{1}{2}$ in. in length, and they include some pretty examples of 'ghost crystals', in which a nucleus of the same form as the crystal is outlined by a layer of brownish particles.

The predominant forms are the steep inverse rhombohedron f $\{11\bar{1}\}$ and the scalenohedron x $\{21\bar{2}\}$, whose faces lie in the zone of the rhombohedral edges and make an angle of 17° 5′ with the faces of f (measured

[1] No. XXIII of this series appeared in this vol., p. 100.

[2] A. Strahan, Geological Survey Memoir of the Isle of Purbeck, 1898, p. 169.

[3] C. Barrois, 'Recherches sur le terrain crétacé supérieur de l'Angleterre et de l'Irlande.' Mém. Soc. Géol. Nord, 1876.

angles varied between 16° 42′ and 17° 2′). In some crystals the forms f and x are equally developed, as shown in fig. 1; in others the rhombohedron predominates, and many have the appearance of three-sided pyramids, having no more than the upper third of the rhombohedron developed, usually modified below by faces of x. The faces of f are smooth and bright, and give perfect images of the goniometer-signal: those of x are usually somewhat uneven. A few crystals show also small faces of a steeper inverse rhombohedron, d {335}, which make an angle of 52° 37′ with the cleavage (observed angle 52° 32′).

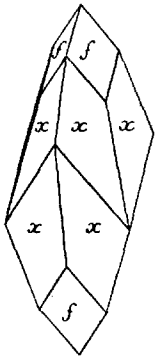

Fig. 1.

Fig. 2.

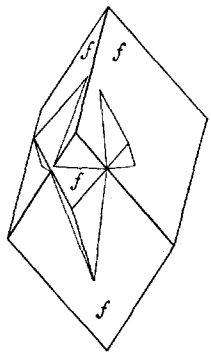

Fig. 3.

Some of the crystals, usually of rhombohedral habit, show twinning about the axis [111], the two individuals being interpenetrant, as in the well-known crystals of cinnabar from China. The interpenetration is somewhat irregular, and corners of one individual project through the faces of the other (fig. 3). These crystals are frequently dull and much rounded, their uneven faces presenting a marked contrast to the brilliant faces of the untwinned crystals.

One group of two crystals with non-parallel axes appears to be a twin on e (110), with contact along an uneven surface transverse to the twin-plane.

The crystals are frequently traversed by twin-lamellae parallel to planes of e {110}, and the lamellae are generally marked by grooves in the surface, due to corrosion. Similar grooves are sometimes also developed along planes of {100}, by corrosion along cleavage-cracks. Well-defined tched pits, of curved triangular form (fig. 2), are sometimes to be seen n bright faces of f. On the other hand, faces of the rhombohedron

$r\{100\}$ (perhaps due to cleavage), which are sometimes visible on the edges of *f*, are always roughened and drusy by corrosion.

Specimens somewhat resembling the above, which were found by Mr. Clement Reid near Corfe Castle, and are now in the Museum of Practical Geology, are probably from the same locality, but the crystals do not appear to have been previously described.

Crystals showing the forms *f* and *x* appear to be rather uncommon, but some resembling fig. 1, from the Chalk of Saint-Julien-du-Sault (Dép. Yonne, France), were figured by Haüy,[1] and a search through the 2,500 published figures of calcite reproduced in Goldschmidt's 'Atlas der Krystallformen' has revealed seven other occurrences of crystals of similar type, of which two are British, viz. those at Pallaflat mine in Cumberland[2] and at Ashgrove quarry in Elgin.[3]

[1] R. J. Haüy, 'Traité de Minéralogie,' 1801, plate xxvii, fig. 42.
[2] S. L. Penfield and W. E. Ford, Amer. Journ. Sci., 1900, vol. x, p. 242.
[3] M. F. Heddle, 'Mineralogy of Scotland,' 1901, vol. i, plate xxv, fig. 54.