A CALCITE CRYSTAL WITH A VERY MISSHAPEN APPEARANCE

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Calcite ($CaCO_3$) is known in many parts of the world and like quartz occurs in perfect and beautiful crystals. The crystallographer also ranks this mineral along with quartz because of studies and experiments performed by some well known physicists who have made very careful and elaborate observations. A number of distinct forms of calcite have been recognized, but only the scalenohedral and rhombohedral will be considered at this time. The specimens of calcite described here were collected near Miami, Oklahoma. They were placed on the surface of a horizontal mirror and were photographed together with their images in a mirror in the background. (Plate I)

The most typical color of these crystals is a honey yellow and they occur most frequently in the form Scalenohedron V (2131), commonly known as "dog-tooth spar" (Fig. 1). The rhombohedron is not so noticeable until the scalenohedron is broken down. The lateral edges of the scalenohedron coincide with those of the rhombohedron. This shows the relation of the scalenohedron to the unit rhombohedron, even though the vertical axis of the former is three times that of the latter.

Reference is now made to a calcite crystal (2½ in. by 2¼ in. by 1¼ in.) which has a very misshapen appearance (C, C_1, D, and D_1; Figs. 3 and 4). This is due to an unusual enlargement of two pairs of faces of the scalenohedron V. It could pass by the casual observer as though it were a negative rhombohedral form, twinned on the obtuse rhombohedron. The measurements made by the goniometer reveal that all of its angles except one are precisely the same as those of the twinned form of the rhombohedron. This angle is between the faces C and C_1 (Fig. 3), and D and D_1 (Fig. 4).

The obtuse rhombohedron e(0112) is quite commonly found to be the twinning plane in the negative rhombohedral form of calcite. The vertical axes are inclined at 52° 30½′, and 127° 29½′. Along this twinning plane e(0112), half of the crystal appears in the reverse position and fits 180° from the non-twinning position.

The most common calcite twins here are represented by the scalenohedrons (Fig. 1). They are twinned on the vertical axis and the twinning plane is c(0001). They are characterized by a horizontal plane of symmetry and the presence of re-entrant angles in the place of the zigzag lateral edges. The angles about the pyramidal faces are 75° 22′, 35° 36′, and 47° 1½′.

Fortunately, the three scalenohedral calcite crystals in juxtaposition were found in which the middle crystal (B) (Fig. 2) is intermediate between A and C. The four following angles are equal: A $\wedge$ A_1, B $\wedge$ B_1, and C $\wedge$ C_1, and D $\wedge$ D_1. So the real form of the crystal represented by C and D is no different from the scalenohedral form A, but only a variation of "habit" due to the enlargement of two of its faces. The conditions under which the misshapen crystal was formed are responsible for its unusual growth in one direction; hence the variation from the ideal form. The most striking features about these crystal specimens are the constancy of their corresponding interfacial angles, the equal angles between corresponding cleavage planes and the unique striations on corresponding faces in spite of over-elongated faces and the apparent truncation of the pyramid.