

It is probably similar to the material from the Richmond Mine, Eureka, Nevada, analysed by Massie<sup>1</sup>.

(6) *Endlichite* from Hillsboro', New Mexico.

A prism of  $31^{\circ} 3'$  with two ground faces, cut from a pale yellow hexagonal prism (2.5 mm. diam.) with basal plane and narrow faces truncating the vertical edges. The basal plane gave several images, and the angles from it to the ground planes varied between  $89^{\circ} 51'$  and  $90^{\circ} 30'$  and between  $89^{\circ} 35'$  and  $90^{\circ} 7'$ . Taking the mean values,  $\theta = 0^{\circ} 11'$ . The natural prism-faces do not fall into a zone.

A cross-section (0.8 mm. thick) of another crystal from the same specimen, does not extinguish in any position, but shows in places a banded structure, suggesting zones of varying composition. Most of the section shows a normally emergent negative bisectrix ( $2E = 14^{\circ}$ ). The axial plane varies in position in different parts of the section, being in some places parallel to a face of a hexagonal prism, and in others inclined to it at various angles.

(7) *Vanadinite* from the Old Mammoth Mine, Tucson, Arizona.

A prism of  $21^{\circ} 10'$  with one ground and one natural face, from a dark ruby-red crystal (hexagonal prism with flat ends,  $m, c, u$ ). [Some other crystals off the same specimen show  $m$  and  $c$ , narrow  $x$ , and minute planes of  $u, s$ .]  $\theta = 0^{\circ} 24'$ .

The indices were determined for the nearly monochromatic red light transmitted by the crystal, which lies between the lines C and D.

The crystal is markedly pleochroic, the colours being:—

$\omega$  brownish-red.

$\epsilon$  brownish-yellow.

### *Note on some rare twins of Calcite from Somerset.*

By H. L. BOWMAN, M.A.

[Read February 4, 1902.]

THE crystals to which this note refers, occur in a quarry in the New Red Sandstone at Bindon, in Somerset, on the property of Mr. H. H. Worthington, and were presented to the Oxford Museum a few months ago by his son, Mr. J. H. Worthington. I have lately had an opportunity of visiting the locality and examining the mode of occurrence of the specimens.

<sup>1</sup> Chem. News, 1882, vol. xlv, p. 215.

The crystals have all been obtained from a single, roughly vertical vein in the side of the quarry, which shows an exposure of irregularly alternating beds of red sandstone and conglomerate. The pebbles of the latter consist, for the most part, of a compact purplish limestone, while a few are of greasy-looking quartz. The vein is at present traceable to a vertical height of about nine feet from the floor of the quarry, and has an average width of about six inches, but in some places it is much narrower and filled up with masses of calcite.

The crystals are thickly scattered over both walls of the vein, and are of two sizes, the larger being uniformly twins of the habits shown in figs. 1 and 2, and usually about one inch in thickness, and as much

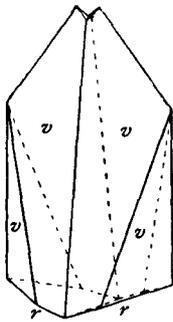


FIG. 1.

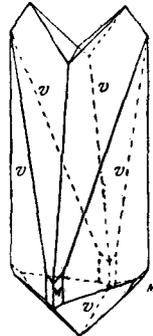


FIG. 2.

Calcite from Somerset. Twin-plane  $f$  (111).

as two inches long. These are sometimes accompanied by smaller, rounded-scalenohedral crystals, about  $\frac{1}{4}$  to  $\frac{3}{8}$  inch in diameter, which are not twinned. The crystals are enveloped in red clay, of which they enclose portions, and are thereby stained red.

The interest of the occurrence lies in the twinning, which takes place according to the rarest of the twin-laws of calcite, the twin-plane being the face  $f$  (111).

The faces of the crystals are dull, and often pitted and cavernous, but measurement of good specimens with the contact-goniometer shows the main scalenohedron to be the common form  $v$  {201}, while one doubly terminated specimen (fig. 2) shows also faces of a steep direct rhombohedron, probably  $M$ {311} [Dana's {4041}]. The crystals are commonly attached by one end to the matrix, and when broken off show a pair of cleavage-planes forming an obtuse (salient) angle of  $35\frac{1}{2}^\circ$  (fig. 1). One crystal gave on measurement  $35^\circ 30'$ , the theoretical angle being  $35^\circ 27'$ .