

labeled "Calaveras County, Cal.," which contained along the fracture surfaces pale greenish yellow spherulites, which an optical examination proved to be durdenite. The following table gives the optical properties of durdenite from the original locality (also in University of California Museum) and from California and shows their identity.

TABLE 1. THE OPTICAL PROPERTIES OF THE TWO DURDENITES

	Honduras	Calaveras County, Cal.
Optical character	Negative	Negative
$2 E_{na}$	$44^\circ \pm 3^\circ$	$48^\circ \pm 3^\circ$
$2 V_{na}$	$22^\circ \pm 2^\circ$	$24^\circ \pm 2^\circ$
Dispersion	$\rho > v$ very strong	$\rho > v$ very strong
Optical orientation	X \perp perfect cleavage. Cleavages are rhombic in outline with 72° angle; Z bisects obtuse angles	X \perp cleavage
α	1.702 ± 0.005	1.710 ± 0.005
β	1.955 ± 0.005	1.94 ± 0.01
γ	1.965 ± 0.005	1.95 ± 0.01
Pleochroism	X Nearly colorless Y Pale greenish yellow Z Rather pale sulfur yellow	Faintly pleochroic

AZURITE FROM TSUMEB, AMBO-LAND, SOUTHWEST AFRICA

ELLIS THOMSON

University of Toronto

AZURITE crystals from this locality have already been described¹ but, as two new forms were discovered on the crystals measured by the author, it was thought that a brief description of the same might be of some interest.

The crystals used were obtained from the Heidelberger Mineralien Comptoir (Fr. Rodrian), Heidelberg, Germany. They are for the most part small and tabular in habit, the largest faces in

¹Z. *Kryst. Min.*, **52**, 225, 1913.

nearly every case being the orthopinacoids. The crystals are translucent, dark azure blue in color, and have a brilliant luster. The reflections from the crystal faces were mostly distinct, only about one-third of them showing multiple images.

Four crystals were measured in all, showing the following forms, the new ones being indicated by *:

$c = 0(001)$, $a = \infty 0(100)$, $m = \infty (110)$, $w = \infty 2(120)$, $l = 0\frac{2}{3}(023)$,
 $f = 01(011)$, $p = 02(021)$, $\sigma = 10(101)$, $\Phi = 20(201)$, $\mu = -\frac{1}{5}0(\bar{1}05)$,
 $\theta = -10(\bar{1}01)$, $\eta = -\frac{3}{2}0(\bar{3}02)$, $V^* = -\frac{7}{5}0(\bar{7}05)$, $v = -20(\bar{2}01)$, $h = 2(221)$,
 $s = 1(111)$, $k = -2(\bar{2}21)$, $R = -24(\bar{2}41)$, $\lambda = -\frac{2}{3}6(2.18.3)$, $U^* = -\frac{2}{3}\frac{3}{2}(496)$.

The elements were determined afresh from three of the four crystals, the fourth crystal showing insufficient symmetry for an accurate determination. These gave average values of $e = 0.0421$, $p_o = 1.0356$, $q_o = 0.8845$, and $\mu = 87^\circ 34' 20''$ which are in close agreement with the values in Goldschmidt's Winkel-Tabellen, which are $e = 0.0419$, $p_o = 1.0357$, $q_o = 0.8797$, and $\mu = 87^\circ 36'$.

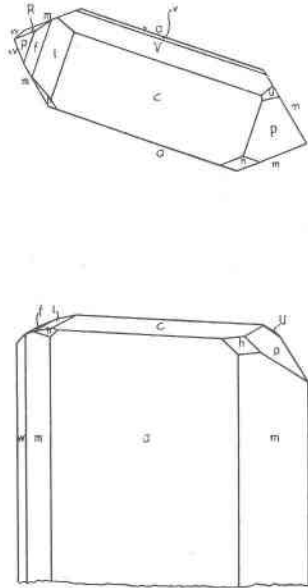


FIGURE 1.—CRYSTAL OF AZURITE FROM TSUMEB.

Crystal 1 is shown in Figure 1, as closely as possible true to nature, in plan and perspective. This crystal shows the two new forms, V and U. The form η , altho appearing on this

crystal, is not shown in Figure 1, as it is too close to the form V to be properly represented in the drawing. The crystals measured varied in dimensions from $6 \times 4 \times 3$ mm. to $3 \times 2 \times 1$ mm.

The forms c, a, m, w, l, R, and p are prominent, being found on all the crystals measured, the forms σ , η , ν , and h somewhat less so, being found on only three of the crystals, while the remaining forms are subordinate. The two new forms, V and U, appear only once on crystal 1, and on no other crystal.

	Symbol	ϕ	ρ
From measurements	U - $\frac{2}{3} \frac{3}{2}$	25°36'	56°12'
	V - $\frac{7}{5} 0$	270°00'	54°43'
From calculation	U - $\frac{2}{3} \frac{3}{2}$	26°10'	55°48'
	V - $\frac{7}{5} 0$	270°00'	54°38'

Of these two new forms, the form V is thus verified, while the form U is extremely probable.

TWINNING IN THE NEW JERSEY "PSEUDOMORPHS"

FREDERICK A. CANFIELD

Dover, N. J.

WITH the view of helping to solve the problem as to what was the mineral which occupied the rectangular cavities, so abundant in the quarries at Paterson and Great Notch, the writer would call attention to the occurrence of molds which indicate that the original mineral sometimes twinned, hoping that all persons interested will examine their specimens, and perhaps find better examples than have been observed thus far.

In the molds which have been examined the narrower sides have been replaced by two planes, which are so inclined as to form re-entrant angles. The cross-section of the mold has the shape of a penetration twin, as shown for instance in Fig. 218, p. 63, in Rogers' "Introduction to the Study of Minerals." In some of the molds the replacements by quartz, filling the thin openings which formed while the original mineral was being leached away, are parallel with the longer sides of the rectangle, and midway between them, showing as is often the case in twinned crystals that the original substance was more soluble at the line of twinning than at any other place.

The specimen examined came from Paterson.