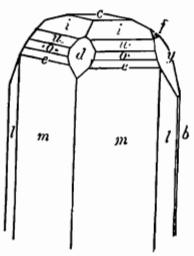
Art. XVIII.—*On the Topaz from the Thomas Range, Utah;** by A. N. Alling.

The topaz crystals under examination were selected out of a considerable number in the cabinet of Professor Brush, from the locality in Utah in the Thomas Range, forty miles north of Sevier Lake, where they occur in rhyolite.† They vary from 3mm to 10mm in length, and are perfectly clear and colorless. The planes for the most part are very highly polished, though vicinal planes appear in a number of cases to disturb the accuracy of measurements. The habit to which most of the crystals conform is shown in the figure. The observed planes are:



Pinacoids b (010, $\breve{i}$), c (001, O); prisms m (110, I), l (120, $\breve{i}$-2); macrodome d (201, 2-$\bar{\imath}$); brachydomes f (021, 2-$\breve{\imath}$), y (041, 4-$\breve{\imath}$); pyramids i (223, $\frac{2}{3}$), u (111, 1), o (221, 2), e (441, 4).

The following angles, each representing the mean of a number of careful measurements with a Fuess compound goniometer, were taken as fundamental:

$$y \wedge y' \; 041 \wedge 0\bar{4}1 = 124° \; 41' \; 45''$$
$$u \wedge u' \; 111 \wedge \bar{1}11 = \; 91° \; 12' \; 0''.$$

From these angles the axial ratio was calculated, viz:

$$\breve{a} : \bar{b} : \dot{c} = 0{\cdot}5285 : 1 : 0{\cdot}47715.$$

It is interesting to note that these values approximate very closely to those obtained by von Kokscharow,‡ upon the Siberian crystals; he gives:

$$\breve{a} : \bar{b} : \dot{c} = 0{\cdot}52854 : 1 : 0{\cdot}47698.$$

On the other hand, the axial ratios for crystals from Ehrenfriedersdorf, Altenberg, Sehneckenstein and Brazil, vary from both more or less widely (compare Grünhut, Zeitsch. Kryst., ix, 113). Some of the calculated and measured angles on the Utah crystals, in addition to those given above, are as follows:

		Calculated.	Measured.
$c \wedge f$	$001 \wedge 021$	$= 43° \; 39'$	$43° \; 39'$.
$c \wedge i$	$001 \wedge 223$	$= 34° \; 15'$	$34° \; 15'$.
$c \wedge o$	$001 \wedge 221$	$= 63° \; 58'$	$63° \; 57'$.
$c \wedge e$	$001 \wedge 44\bar{1}$	$= 76° \; 14\frac{1}{2}'$	$76° \; 12'$.
$u \wedge u'''$	$111 \wedge 1\bar{1}1$	$= 39° \; 0'$	$39° \; 1'$.
$o \wedge o'''$	$221 \wedge 2\bar{2}1$	$= 49° \; 39'$	$49° \; 39'$.
$y \wedge e$	$041 \wedge 44\bar{1}$	$= 59° \; 11'$	$59° \; 9'$.
$m \wedge m'''$	$110 \wedge 1\bar{1}0$	$= 55° \; 43'$	$55° \; 44'$.

* Abstract of a college thesis written June, 1886.

† Compare W. Cross, this Journal, xxxi, 437, June, 1886.

‡ With v. Kokscharow the vertical axis has double the length taken here.

Advantage was taken of a natural prism to measure the indices of refraction β and γ. Further, the optic axial angle was also obtained from a cleavage section. The values obtained are as follows :

$\beta = 1{\cdot}6104$ for yellow (sodium) $= 1{\cdot}6075$ for red (lithium).
$\gamma = 1{\cdot}6176$ " " $= 1{\cdot}6148$ " "
$2E = 126° 24'$ for yellow.
Also $2V = 67° 18'$ and $a = 1{\cdot}6072$ calculated.