

drilling away the overlying quartz and feldspar, working on a large scale much as the ordinary collector does in his development of small cabinet specimens. Upon the completion of this work, Mr. Alger considered this beryl as one of the specimens in his collection and found pleasure in showing it to his friends, but the ravages of time and the hammers of collectors have done much to mar the value of this outdoor specimen.

The Grafton locality above mentioned is about 40 km. (25 m.) in an air line, northeast from the Acworth locality and is reached from South Danbury or Grafton stations of the Boston & Maine Railroad, about three and one half hours' run from Boston on the main line, between that point and White River Junction. The Grafton geology is essentially like that of Acworth, in that the beryls are in pegmatite, cutting metamorphic rocks, altho feldspar is more abundant at Grafton than at Acworth; it was this abundance which led to the opening of the Grafton pit, whose product, at one time, was exported to England.

Any information regarding the disposition of other large New Hampshire beryls would be of interest to the Boston Society of Natural History, and it is hoped that we may hear from readers of this note in regard to such specimens.

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## CRYSTALLOGRAPHY OF SOME CANADIAN MINERALS. STEPHANITE, EPIDOTE, AND CALAMINE<sup>1</sup>

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### 5. STEPHANITE, DRUMMOND MINE, ONTARIO

The specimen which furnished the material for this note was obtained at the Drummond mine, Coleman township, Ontario, and was kindly loaned by Dr. R. Harvie. It consisted of a confused mass of calcite crystals holding in small cavities crystals of stephanite and pyrite, together with small quantities of wire silver and argentite. Thru the kindness of Dr. Harvie the writer was permitted to remove two small crystals of the stephanite for measurement. The crystal habit is tabular, the base, the brachypinacoid and the unit prism being well de-

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veloped. No evidences of the macropinacoid could be obtained, and the domes are all relatively small. The first crystal examined proved to be a twin. The second crystal examined proved to be a trilling, on the unit prism  $o$  (110) in each case.

The following forms were identified as occurring on these crystals:

TABLE 1. ANGLE TABLE FOR STEPHANITE, DRUMMOND MINE, ONTARIO  
*Forms observed on two measured crystals*

Letter (Gdt.)	Symbol	Calculated		Measured	
		$\phi$	$\rho$	$\phi$	$\rho$
<i>c</i>	001		0° 00'		0° 00'
<i>b</i>	010	0° 00'	90° 00'	0° 00'	90° 00'
<i>o</i>	110	57° 49'	"	57° 49'	"
<i>P</i>	111	"	52° 08'	"	52° 25'
<i>h</i>	112	"	32° 45'	"	32° 49'
<i>m</i>	113	"	23° 13'	"	23° 15'
<i>r</i>	221	"	68° 46'	"	68° 25'
<i>Q</i>	773	"	71° 34'	"	71° 19'
<i>k</i>	011	0° 00'	34° 25'	0° 00'	34° 29'
<i>d</i>	021	"	53° 52'	"	53° 59'
<i>t</i>	023	"	24° 33'	"	24° 29'
<i>f</i>	133	27° 55'	37° 47'	27° 30'	37° 37'
<i>v</i>	132	"	49° 18'	27° 46'	49° 40'

Stephanite had previously been reported from the Colonial mine in the same area, and crystals measured by Professor Victor Goldschmidt have been described.<sup>1</sup>

For purposes of comparison of crystals from the two mines the following table has been prepared.

TABLE 2. OCCURRENCE OF FORMS ON STEPHANITE, COBALT CAMP

Letter	Symbol	Localities		Letter	Symbol	Localities	
		Colonial Mine	Drummond Mine			Colonial Mine	Drummond Mine
<i>c</i>	001	x	x	<i>P</i>	111	x	x
<i>b</i>	010	x	x	<i>r</i>	221	x	x
<i>o</i>	110	x	x	<i>w</i>	131	x	
$\pi$	130	x		<i>C?</i>	161	x	
<i>t</i>	023	x	x	<i>K</i>	155	x	
<i>k</i>	011	x	x	<i>f</i>	133	x	x
<i>d</i>	021	x	x	$\rho$ :	241	x	
<i>e</i>	041	x		<i>v</i> :	132	x	x
<i>c</i>	102	x		$\vartheta$ :	152	x	
<i>q</i>	114	x		$\omega$ :	134	x	
<i>m</i>	113	x	x	<i>n</i> :	135	x	
<i>h</i>	112	x	x	<i>Q</i> :	773		x

<sup>1</sup> *Rept. Ontario Bur. Mines, 1913, p. 25* (Cobalt-Nickel Arsenides and Silver Deposits of Timiscaming).

## 6. EPIDOTE, WHITE HORSE RAPIDS, YUKON.

The specimens which furnished the material for this note were obtained from the vicinity of White Horse Rapids, Yukon. They consisted of a more or less intimate association of epidote, quartz, calcite, actinolite and tremolite and were found in connection with garnetiferous rock.

The greater part of the epidote assumes a crystalline-massive form, but here and there, particularly in contact with calcite and quartz, crystals eminently suitable for measurement are to be found. The largest of these latter measured 7 mm. in length and 5 mm. in width. Over fifty crystals were examined and a goodly number of these showed twinning along the direction of the ortho pinacoid  $t$  (100). Generally speaking the domes are found to be well developed, while the pyramids are small. Two new negative orthodomes  $\psi_0$  ( $\bar{8}03$ ) and  $\phi_0$  ( $\bar{1}5.0.8$ ) were observed; both of these possessed good luster. Two new positive domes  $S_0$  (104) and  $\Sigma_0$  (504) were identified on three of the crystals. The general habits of the crystals are illustrated by orthographic projections, Figs. 3 and 4.

The following list indicates the forms observed:

TABLE 3. ANGLE TABLE FOR EPIDOTE, WHITE HORSE, YUKON  
New forms marked \*

Letter	Symbol	Calculated		Measured	
		$\phi$	$\rho$	$\phi$	$\rho$
$c$ .....	001	90° 00'	25° 24'	90° 00'	25° 25'
$t$ .....	100	"	90° 00'	"	90° 00'
$z$ .....	110	35° 00'	"	34° 55'	"
$u$ .....	210	54° 28'	"	54° 16'	"
$a$ .....	$\bar{2}01$	50° 00'	64° 02'	50° 00'	64° 06'
$r$ .....	$\bar{1}01$	"	38° 18'	"	38° 22'
$N$ .....	$\bar{3}04$	"	25° 20'	"	25° 32'
* $\psi_0$ .....	$\bar{8}03$	"	70° 57'	"	70° 50'
* $\phi_0$ .....	$\bar{1}5.0.8$	"	62° 12'	"	62° 43'
$n$ .....	111	23° 37'	63° 03'	23° 36'	63° 24'
$q$ .....	221	29° 38'	76° 28'	29° 37'	76° 47'
$e$ .....	101	90° 00'	60° 06'	90° 00'	60° 09'
$\Theta$ .....	201	"	71° 35'	"	71° 31'
* $S_0$ .....	104	"	38° 21'	"	38° 27'
* $\Sigma_0$ .....	504	"	64° 03'	"	64° 09'

## 7. CALAMINE, AINSWORTH, B. C.

The calamine crystals here described were collected by E. D. Ingall of the Geological Survey in 1892<sup>1</sup> at the Skyline Claim,

<sup>1</sup> *Geol. Surv. Can.*, N. S., 6, 28K, 1892-93.

3.2 km. (2 miles) west-southwest from Ainsworth, West Kootenay district, British Columbia.

The crystals are small and tabular in habit and form radiating groups on the walls of cavities in a grayish-white cryptocrystalline quartz. They are sometimes associated with botryoidal malachite and are not infrequently thickly encrusted with this mineral. They are colorless and translucent, and under a low magnification the faces appear polished and smooth, but under higher magnification they show evidences of corrosion.

The general crystal habit is illustrated in orthographic and clinographic projection in Fig. 5; altho a large number of crystals were examined, only the following forms were identified:  $a$  (010);  $e$  (011);  $s$  (101);  $t$  (301);  $p$  (230) (Goldschmidt's notation).

The prism  $p$  (230) and the brachy pinacoid  $a$  (010) show vertical striations, and in the case of one very small crystal the orthodome  $t$  (301) could not be detected.

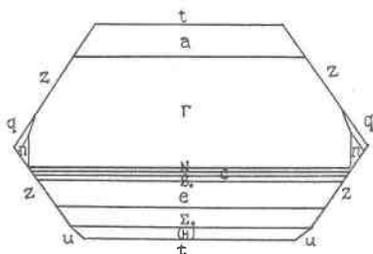


FIG. 3. Epidote, White Horse, showing new domes  $S_0$  and  $\Sigma_0$ .

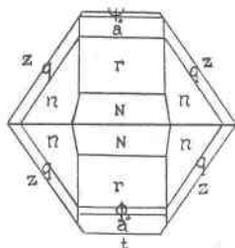
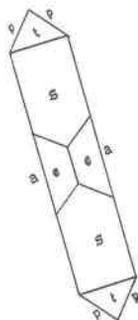


FIG. 4. Epidote, White Horse, showing new domes  $\psi_0$  and  $\phi_0$ .

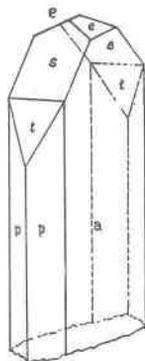


FIG. 5. Calamine, Ainsworth.