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A CANADIAN OCCURRENCE OF FAIRCHILDITE AND BUETSCHLIITE[1]

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Fairchildite ($K_2CO_3.CaCO_3$) and buetschliite ($3K_2CO_3.2CaCO_3.6H_2O$) have been identified from the trunk of a partially burned hickory tree near Deseronto, Ontario. The attention of the writers was drawn to this occurrence by officers of the Defence Research Board who submitted specimens to the Geological Survey of Canada for identification. Subsequently, one of us (K.R.D.) visited the occurrence and collected additional material from the top of the burned stump and from the ground beneath the fallen trunk.

The mottled grey and white stony material in the wood-ash is fine grained and has a fused appearance on the surface. It is readily soluble in dilute hydrochloric acid at room temperature. In thin section, the material consists of radiating aggregates of acicular mineral grains with scattered grains of charcoal and calcite. The acicular material was weathered to the extent that it was not possible to measure any of the optical properties of the minerals. Spectrographic analyses by W. F. White of the specimen indicate that magnesium and calcium are the major constituents with minor amounts of potassium and phosphorus.

Three distinct powder diffraction patterns were obtained from the samples submitted to the *x*-ray laboratory; two were identified as fairchildite and buetschliite with minor mutual contamination, and the third as calcite. The *x*-ray powder photographs were taken using a camera with diameter 57.54 mm., and nickel-filtered copper radiation. The observed intensities and measured *d*-spacings are presented in Table 1 together with the measurements for fairchildite and buetschliite of Milton & Axelrod (1947).

The close agreement between these two sets of patterns together with spectrographic analyses and the mode of occurrence confirms the identi-

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TABLE 1. BUETSCHLIITE AND FAIRCHILDITE: *X*-RAY POWDER PATTERNS

Buetschliite (G.S.C.10441) (λ = 1.5418)		Buetschliite (M. & A. 1947)		Fairchildite (G.S.C.10708) (λ = 1.5418)		Fairchildite (M. & A. 1947)	
I	*d*(meas)	*I*	*d*(meas)	*I*	*d*(meas)	*I*	*d*(meas)
3	4.55 Å	vw	4.97 Å	5	6.68 Å	m	6.64 Å
		w	4.52	4	4.56	w	4.59
3	4.13	vw	4.15	2	4.35	vw	4.31
1	3.52			1/2	3.51	vvw	3.53
		w	3.25	1/2	3.35	vw	3.33
*5	3.18	vw	3.16	10	3.20	vs	3.19
4	3.02	s	3.03	*1	2.87		
10	2.866	vvs	2.860	4	2.707	w	2.689
7	2.690	s	2.688	7	2.644	s	2.641
4	2.636			1	2.292	vw	2.283
1/2	2.310	w	2.306	3	2.232	m	2.211
4	2.259	ms	2.251	4	2.168	m	2.154
*1	2.221			2	2.108		
*1	2.166			3	2.032	w	2.027
3	2.106			*2	1.945		
6	2.069	s	2.070	4	1.892	m	1.880
1	2.014	m	2.012	1/2	1.750	vvw	1.749
4	1.963	ms	1.960	1	1.709	vvw	1.710
4	1.754	m	1.751	2	1.699	w	1.696
5	1.694	s	1.690	1	1.643	vvw	1.663
		vw	1.642	1	1.617	vw	1.607
2	1.618	ms	1.612	1	1.530	w	1.522
2	1.585	m	1.583	1/2	1.489		
1	1.554	w	1.553	1	1.410		
2	1.492	w	1.508			vw	1.405
		vw	1.455	2	1.320	vw	1.319
		vw	1.420	1	1.279	vw	1.277
		vw	1.380	1	1.220	vw	1.215
2	1.345	m	1.345	1/2	1.184		
1	1.267	m	1.263				
		m	1.246				
1/2	1.232	w	1.230				
2	1.220	m	1.217				
		vw	1.205				
1/2	1.132	vw	1.130				
1/2	1.120	vw	1.118				
1	1.107	vw	1.108				
		w	1.101				
1	1.054	w	1.052				
2	1.045	m	1.042				
1	1.026	m	1.024				
1	1.017	w	1.016				
1	0.945	vw	0.951				
		plus 14 weak lines					

*Extra lines due to mutual contamination.

fication of fairchildite and buetschliite in the sample. This constitutes the first recorded occurrence of these minerals in Canada.

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