SHORTER COMMUNICATIONS

NEW CANADIAN MINERAL OCCURRENCES: I. EUCRYPTITE, POLLUCITE, ROZENITE, EPSOMITE, DAWSONITE, FAIRCHILDITE AND BÜTSCHLIITE

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INTRODUCTION

This is the first of what we hope will be a continuing series of short notes on new occurrences of minerals in Canada. No attempt will be made to give a complete mineralogical description of each species. Where certain data for a species have not been published before, such data will be included; but, in general, the main purpose of the note will be to put the occurrence on record.

EUCRYPTITE

The rare lithium aluminium silicate, eucryptite, has been reported from Branchville, Connecticut (Brush & Dana, 1880); Center Strafford, New Hampshire (Mrose, 1953); Harding Mine, Dixon, New Mexico (Mrose, 1953); and Bikita, Southern Rhodesia (Hurlbut, 1962). In 1962, several specimens were submitted to us by a prospector, Mr. J. McDermott of Port Credit, Ontario, for identification. The specimens were from a pegmatite " . . . near Nakina, Ontario". No further information on the locality has been received.

Some of the material was spodumene but an *x*-ray powder pattern distinct from that of spodumene was obtained from other material. The data from this pattern are identical to those published by Hurlbut (1962) for eucryptite from Bikita.

Specimens of eucryptite from Ontario (M 26191, M 26192), Connecticut (M 5258, M 24060) and Southern Rhodesia (M 24411, M 25041), fluoresce pink to red under short wave ultraviolet light. The most intense red fluorescence comes from the Ontario mineral.

POLLUCITE

A new occurrence of pollucite in Canada has been brought to our attention by Mr. Art L. Wilson of Dryden, Ontario. Specimens of the mineral were identified by Mr. Wilson by a cesium spot test. Subsequent *x*-ray diffraction analysis in our laboratory confirmed his identification. The pollucite occurs in large masses (up to 20 cm.) and is associated with large crystals of spodumene. The specimens were found by Messrs. Alex Kozowy and Alex Ledichowski about three miles slightly northeast of Gull Wing Lake in Webb Township, Ontario. The location is about twenty miles northeast of Dryden, Ontario. Specimens are registered in the R O M collection as M 26202 and M 26203.

Rozenite and Epsomite

Rozenite ($FeSO_4.4H_2O$) and epsomite ($MgSO_4.7H_2O$) have been identified from the Dundas Quarry, Dundas, Ontario. The specimens were submitted to the Museum for identification by Mr. Mike R. Sheba, amateur mineral collector of Toronto.

On the Dundas specimens, rozenite occurs as white to yellowish irregular encrustations. The mineral was identified by *x*-ray powder diffraction and gives a distinct pattern, identical to the data published for rozenite by Jambor & Traill (1963). The specimen is catalogued in the R O M collection as M 26109.

Epsomite is found as earthy white encrustations. The mineral appears to have been precipitated from solutions which have penetrated the fractures in the limestone. The material has a very bitter taste and was identified by *x*-ray powder diffraction. The powder data check with those given for epsomite by Swanson *et al.* (1957). The specimen is catalogued in the R O M collection as M 26110.

Dawsonite

The type locality for dawsonite is the McGill University campus, Montreal, Quebec, where the mineral was found in 1874. Since then, it has been found in several places throughout the world. Recently, Mr. Jacques Bradley of St. Hilaire, Quebec, sent us a specimen which he had collected at St. Bruno, Quebec (about twelve miles east of Montreal). The material was found in a quarry operated by the Richelieu Paving Company Limited on the north side of the mountain. The specimen, which is mainly a black limestone, contains numerous radiating groups of colourless to white crystals. An *x*-ray powder pattern of these crystals matched patterns of dawsonite from Montreal. The St. Bruno dawsonite occurs in fractures and is associated with quartz, pyrite, and analcite.

Table 1 lists indexed *x*-ray powder data for dawsonite from Montreal (M 14875). These data are presented because the data given by Traill

TABLE 1. *X*-RAY POWDER DATA FOR DAWSONITE (Montreal, M14875)
Ni-filtered Cu radiation Camera diameter 114.6 mm.

I	*d* obs.	*d* calc.	*hkl*
½	6.25		
10	5.67	5.67	110
½	4.94	4.92	011
½	4.51		
6	3.38	3.385	200
2	3.31	3.316	121
2	3.09	3.086	130
½	2.950	2.945	031
½	2.834	2.837	220
9	2.784	2.788	211
7	2.601	2.600	040
4	2.500	2.504	112
3	2.221	2.222	231
6	2.151	2.153	202
2	2.066	{2.062	240
		2.069	132
7	1.988	1.988	150
4	1.949	1.949	051
½	1.909	1.902	042
½	1.892	1.891	330
1	1.836	1.831	013
7	1.728	1.730	312
5	1.689	{1.692	400
		1.689	251
6	1.656	1.658	242
2	1.620	1.619	152
1	1.607	1.609	420
		1.608	161
½	1.565	1.565	332
3	1.542	1.543	260
1	1.527	1.529	350
3	1.473	1.472	062
1	1.417	1.418	440
4	1.392	{1.395	004
		1.394	422
1	1.350	1.350	262
5	1.339	1.341	352
½	1.302	1.300	080
1	1.288	{1.290	204
		1.287	172
½	1.283	1.283	253
1	1.271	1.271	134
1	1.256	1.257	343
½	1.229	1.229	044
½	1.210	{1.210	512
		1.211	460
½	1.165	1.161	073
½	1.142	{1.139	190
		1.142	154
3	1.135	1.135	550
1	1.126	1.126	600
3	1.111	{1.110	015
		1.111	462

I	*d* obs.	*I*	*d* obs.	*I*	*d* obs.	*I*	*d* obs.
1	1.097	½	1.031	½	.9750	½	.9435
2	1.084	½	1.013	½	.9655	½	.9380
½	1.053	½	.9940	½	.9560	½	.9450
½	1.037						

& Sabina (1960), while sufficient for routine identification work, are not complete. The unit cell data (*Imcm*, $a = 6.77$, $b = 10.40$, $c = 5.58$ Å) given by Frueh (1964) were used to index the powder patterns.

Stevenson & Stevenson (1965), in a paper dealing with the petrology of dawsonite, state that workers who have reported dawsonite from other localities in the vicinity of Montreal may have misidentified other species as the mineral. They, therefore concluded: "It would appear that unique conditions obtained in and along the McGill feldspathic dike at the time of the formation of the dawsonite". The presence of dawsonite in the quarry at St. Bruno disproves this last conclusion.

Fairchildite and Bütschliite

Fairchildite ($K_2CO_3.CaCO_3$) and bütschliite ($3K_2CO_3.2CaCO_3.6H_2O$) have been identified from the trunk of a burned birch tree near Eganville, Ontario. The sample was found by Royce Swant, student at the Eganville District High School, who submitted the material for identification through his principal, Mr. D. P. Whillans.

Fairchildite and bütschliite first were identified by Milton & Axelrod (1947) in fused wood-ash stones found at several localities in the burned forests of the western United States. Dawson & Sabina (1958) recorded the first occurrence of these minerals in Canada from the trunk of a partially burned hickory tree near Deseronto, Ontario.

The Eganville minerals were identified by *x*-ray powder diffraction. A distinct powder pattern was obtained for bütschliite, but fairchildite always showed contamination by bütschliite. The specimen has a fused appearance on the surface and varies in colour from a yellowish-gray, hard internal mass to a crumbly white to grayish-black crust. The outer flaky crust was found to contain mostly bütschliite, whereas the hard internal mass contains both fairchildite and bütschliite. This constitutes the second recorded occurrence of the minerals in Canada, and the specimen is catalogued in the R O M collection as M 26179.

Acknowledgements

This report of new occurrences of relatively rare minerals could not have been possible if the specimens had not been brought to our attention. It is with great pleasure that we acknowledge the assistance of the following: Mr. J. McDermott, Mr. Art L. Wilson, Mr. A. Kozowy, Mr. A. Ledichowski, Mr. Mike R. Sheba, Mr. Jacques Bradley, Mr. Royce Swant, and Mr. D. P. Whillans.

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ZINCKENITE

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Although the structural crystallography of zinckenite, a sulphantimonite of lead, has been studied carefully (Vaux & Bannister, 1938; Nuffield, 1946), the quality of the available analyses of this mineral is not high enough to settle the question of cell content. A recent *x*-ray spectrographic analysis of exceptionally fine zinckenite from Wolfsberg, Harz, Germany, may answer the question.

The symmetry of zinckenite originally was considered to be orthorhombic (pseudo-hexagonal), with twinning on (110), but Vaux & Bannister determined the unit cell as hexagonal, with a = 44.06, c = 8.60 Å. The composition of zinckenite was taken formerly as $PbS.Sb_2S_3$, but Vaux & Bannister found that the cell content 12 [$6PbS.7Sb_2S_3$] is more likely than 81 [$PbS.Sb_2S_3$]. Berry (1943) suggested that zinckenite might still be orthorhombic with very small departure from hexagonal symmetry, and that the cell content might then be 160 [$PbS.Sb_2S_3$]. Nuffield (1946) confirmed the cell dimensions of Vaux & Bannister on a fine specimen from Wolfsberg, and measured the specific gravity on a single clean crystal weighing 23 mg., as 5.36. The alternative cell contents appeared to be 81 [$PbS.Sb_2S_3$] (calc. sp. grav. 5.35), 80 [$PbS.Sb_2S_3$] (calc, sp. grav. 5.28), and 12 [$6PbS.7Sb_2S_3$] (calc. sp. grav. 5.22). Largely on the basis of the specific gravity determination, Nuffield suggested the composition $PbS.Sb_2S_3$, with either 81 or 80 formula in the unit cell as the mostly likely cell contents for zinckenite.