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MINERALOGY.—*The crystallography of variscite.* WALDEMAR T. SCHALLER, Geological Survey.

In a recent publication¹ I gave a description of variscite crystals from Utah. All of the material then available showed the same crystal habit, a rectangular, tabular one which was illustrated by crystal drawings and by a photograph. Thru the kindness of Messrs. Edison and Bird, of Lucin, Utah, I have recently examined a larger number of specimens and found that the mineral crystallizes in several additional habits, such as very thin plates, long prisms and octahedral pyramidal crystals of which the unit pyramid {111} is the dominant form. Beautiful little twin crystals were also found in a measurable condition.

The number of crystal forms has been extended from the four given in the paper above cited to over fifteen. A full description of these crystals with their angular measurements is to be given in a paper nearly ready for publication.

MINERALOGY.—*New manganese phosphates from the gem tourmaline field of Southern California.* WALDEMAR T. SCHALLER, Geological Survey. To be published in a Geological Survey Professional Paper, entitled: "The Gem Tourmaline Field of Southern California."

The various properties of these new minerals and their relation to each other will be fully described in the report referred to above.

¹ Schaller, Waldemar T.: Crystallized Variscite from Utah. Proc. U. S. National Museum, 41: 413-430, plate. 1912.

All of these minerals were found at Pala, San Diego County, California.

Palaite.¹ Probably monoclinic. A flesh-colored hydrous manganese phosphate, resulting from the alteration of lithiophilite. D. 3.14 – 3.20; mean refractive index about 1.655, slightly lower than that of hureaulite; double refraction low. Forms crystalline masses in the cavities of which are found distinct crystals. In thin section colorless, and non-pleochroic. Formula $5\text{MnO} \cdot 2\text{P}_2\text{O}_5 \cdot 4\text{H}_2\text{O}$, (Analysis 1). It alters to hureaulite. Found in the Stewart Mine at Pala, from which the name of the mineral is derived.

Stewartite. Probably triclinic. A hydrous manganese phosphate from the Stewart Mine, after which it is named. It is very abundant as an alteration product of lithiophilite which it replaces along its cleavage cracks. The first formation of stewartite is in fine fibers arranged normal to the cleavage cracks of the lithiophilite. Irregularly bounded areas and minute but distinct crystals of stewartite were also noted. The crystal form and optical properties of these minute crystals serve to characterize the mineral and to show that it cannot be identified with any known species. Altho abundant, it is so intermingled with the other minerals of similar composition that a pure sample of it, sufficient for quantitative analysis, could not be obtained. Its importance in the alteration of lithiophilite necessitates a name for the mineral which its physical properties suffice to establish. D. 2.94. Mean refractive index about 1.65. Double refraction very high, probably not under 0.05. Pleochroic: colorless, pale yellow, yellow. Extinction inclined on all crystal edges. Axial angle large, negative, dispersion strong. Probably the same as the unknown mineral "A" described by Lacroix.²

Salmonsite. Named after Mr. Frank A. Salmons, formerly of Pala, and found in the Stewart Mine. It results from the partial oxidation and hydration of hureaulite, and forms cleavable masses of a buff color, seamed by small veins of fibrous palaite and sprinkled with small masses of blue strengite. D. 2.88.

¹ Pronounced Pá-la-ite.

² Lacroix, A.: *Minéralogie de la France*, 4: part 2, p. 506. 1910.

Mean refractive index about 1.66, double refraction low. In thin section yellow and non-pleochroic. Formula $\text{Fe}_2\text{O}_3 \cdot 9\text{MnO} \cdot 4\text{P}_2\text{O}_5 \cdot 14\text{H}_2\text{O}$, (Analysis 2).

Sicklerite. Named after the Sickler family, formerly of Pala. Found in cleavable masses at the Vanderburg-Naylor Mine on Hiriart Hill near Pala. Dark brown color with a light yellow-brown streak. D. 3.45. Refractive indices about 1.74, double refraction moderate. Pleochroic in yellow and brown. Formula $\text{Fe}_2\text{O}_3 \cdot 6\text{MnO} \cdot 4\text{P}_2\text{O}_5 \cdot 3(\text{Li},\text{H})_2\text{O}$, (Analysis 3). Readily fusible before the blowpipe giving a lithium flame. Results from the alteration of lithiophilite.

In addition to the above named new minerals, there occur at Pala, associated with them, the following whose properties and relations to one another will be given in detail in the full report: lithiophilite, hureaulite, strengite (the same as the angelardite of Lacroix,³) triplite, purpurite,⁴ manganite and psilomelane.

ANALYSES AND RATIOS OF NEW MINERALS

	PALAITE		SALMONSITE		SICKLERITE	
	Analysis	Ratios	Analysis	Ratios	Analysis	Ratios
FeO.....	7.48	5.00	0.13	9.18	33.60	6.28
MnO.....	40.87		37.74		0.20	
CaO.....	1.77		1.06		11.26	
Fe ₂ O ₃	0.16		9.53		1.00	
Mn ₂ O ₃				2.10	1.09	
P ₂ O ₅	39.02	1.93	34.86	4.10	43.10	4.00
H ₂ O(110°).....			0.43			
H ₂ O+.....	10.43	4.07	15.30	14.17	1.71	2.92
Li ₂ O.....	trace				3.80	
Insoluble.....	0.89		1.40		4.18	
	100.62		100.45		99.95	

³ Loc. cit., p. 522.

⁴ Compare this Journal, 1: 113. 1911.