ON THE NATURE OF LOUISITE.—BY PROF. T. L. WALKER, PH. D., Director of the Royal Ontario Museum of Mineralogy, Toronto, Ontario.

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In 1878, Honeyman, *Nova Scotian Institute of Natural Science*, Vol. V, *p. 15*, gave this name to a zeolite which formed part of a boulder picked up on the Blomidon shore, King's County, Nova Scotia, by Mr. Robert W. Starr, who accompanied Dr. D. Honeyman while he was engaged in July, 1877, in the study of the geology of that region. It was analyzed by Henry Louis, then of Londonderry Mines, N. S., after whom it was named by Dr. Honeyman. The mineral was closely related to apophyllite in composition except that it was much higher in silica.

The type specimen is the property of the Provincial Museum in Halifax, and when Mr. Harry Piers, curator of that institution, suggested that it should be re-examined, I gladly accepted in order to find the true place of louisite among the zeolites.

The specimen, which is waterworn, weighed less than one pound. It is white on the outer surface, and when examined by a strong lens is seen to contain innumerable tiny roundish masses somewhat glassy in lustre. The white crust extends to a depth of about an eighth of an inch and surrounds the leek-green glassy mineral which has been known as louisite. Louisite is quite cleavable in one direction, possesses a vitreous lustre, and as it can be readily scratched with a knife, appears to be about 5 in the scale of hardness. Its streak is white, and according to Louis it has a density of 2.41.

A thin section prepared for microscopic study showed when examined between crossed nicols that louisite is an aggregate of radiating spherules of quartz in cleavable apophyllite. (Figure 1). A portion from the centre of the mass was crushed and treated with a heavy liquid consisting of bromoform and carbon tetrachloride of such a density that about half of the powdered mineral floated, while the rest sank to the bottom.

When these two portions were examined with the microscope, it was found that the lighter was almost entirely free from quartz spherules and had a density of 2.369 which agrees with the known values for apophyllite. In the heavier portion nearly all the grains were complex, consisting of radiating masses of quartz usually attached to fragments of apophyllite. The density of the heavier portion was found to be 2.542 which would correspond to a mixture of quartz and apophyllite in the ratio of 2 : 1.

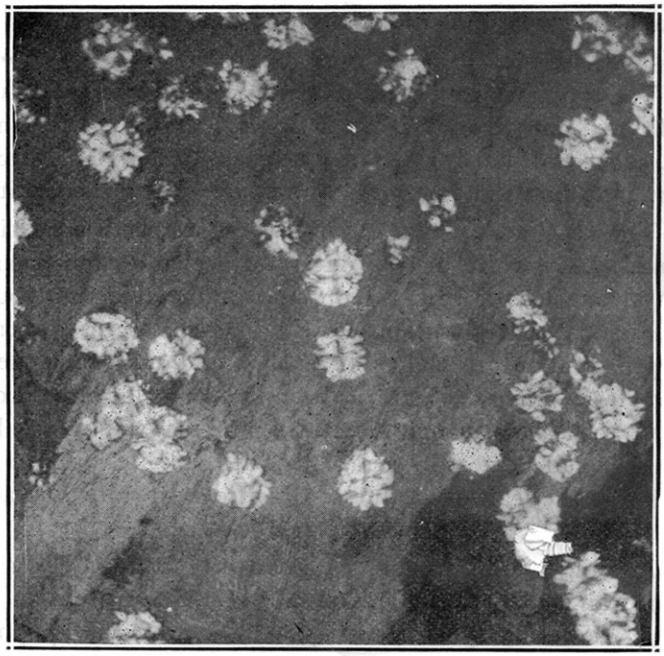

Fig. 1. Microphotograph of louisite spherules of quarts in apophyllite, crossed nicols x 40 diameters.

The apophyllite was analysed by E. W. Todd with the following result:

	%	Molecu. ratio	Apophyllite	Bal.
SiO_2	53.64	.893	.864	.029
Al_2O_3	.12	.001	....	.001
Fe_2O_3	.18	.001	....	.001
CaO	24.19	.432	.432	....
Na_2O	.64	.010	.007	.003
K_2O	4.42	.047	.047	....
H_2O	16.61	.923	.905	.018
F	.48	.026	.026	....
Less oxygen equivalent	(− .20)			
	100.08			

The molecular ratios of the different constituents are indicated in the second column. In the third the constituents which go to form the apophyllite, using the formula of Rammelsberg, $4CaO, 8SiO_2. 8H_2O. K(F.OH)$, are indicated. In the last column the balance is very small, consisting of 1.74% SiO_2, .12 Al_2O_3, .18 Fe_2O_3, .18 Na_2O, and .32 H_2O. Chemically considered, the lighter portion is very nearly pure apohyllite with a little quartz and very slight mixture probably of some zeolite.

The optical properties of the two minerals which make up the aggregate known as louisite, were examined by the immersion method and found to possess indices of refraction in accord with the suggestion that the individual minerals are quartz and apophyllite.

I wish to acknowledge the kindness of Mr. Piers in permitting me to examine the only known specimen of louisite.