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ART. V.—*Contributions to Mineralogy;* by ALBERT R. LEEDS, Prof. of Chemistry in the Stevens Institute of Technology.

I. *A Hydrous Unisilicate approaching Pyrosclerite.*

OCCURS at the so-called Magnesia Quarries, from which the deweylite, at one time largely employed in the manufacture of Epsom salts, was quarried, in the Bare Hills, Md. Since this mineral, in common with the other hydrous unisilicates of a similar character, is to be regarded as most probably one of the results of a process of alteration which has operated powerfully upon the rock masses constituting the Bare Hills, it is important to mention exactly its method of occurrence, which I do from a personal examination of the locality. It is found in a nearly vertical seam several inches wide, between walls of deweylite on one side and talc on the other: the deweylite graduates into albite; the talc is bounded by common serpentine with folia, whose surfaces are normal to the line of contact with the talc.

H. = 1·5–2. G. = 2·558. Color grayish, inclining in some places to bronze-yellow. Golden luster on fresh cleavage surface. Translucent in thin folia; transmitted light, brownish-yellow. Brittle. Orthorhombic. Largest crystals from this locality $3^{mm.}$ long in the direction of the macrodiagonal. Basal cleavage eminent. Optically biaxial. Heated in closed tube yields much water of a neutral reaction, and exfoliates vigorously. The folia are pearly-white and opaque. Decomposed by hydrochloric acid, the silica being left behind in microscopic colorless scales. Iron reaction with microcosmic salt. With calcic chloride in spectroscope, the lithium band. Composition:

	I.	II.	Mean.	Calculated.	O ratio.	
SiO_2	36·03	35·84	35·99	37·45	19·195	6
Al_2O_3	9·19	9·85	9·52	14·27	4·436	2
Fe_2O_3	5·48	5·21	5·35		1·605	
FeO	0·94	1·21	1·08		0·240	4
MgO	33·05	32·93	32·94	33·30	13·176	
Na_2O Li_2O	0·41	0·41	0·41		0·106	
H_2O	14.66	14·53	14·60	14·98	12·978	4
	99·76	99·98	99·89	100·00		

Or for the bases and silica, O ratio = 19·56: 19·19. This makes the mineral a hydrous unisilicate of the formula $(\tfrac{2}{3}\dot{\mathrm{M}}\mathrm{g}^3+\tfrac{1}{3}(\overline{\mathrm{Al}},\overline{\mathrm{Fe}})^2\,\ddot{\mathrm{S}}\mathrm{i}^3+4\,\dot{\bar{\mathrm{H}}}$. It will be seen by a comparison of this formula with that of pyrosclerite $(\tfrac{2}{3}\dot{\mathrm{R}}^3+\tfrac{1}{3}\,\overline{\mathrm{Al}})^2\,\ddot{\mathrm{S}}\mathrm{i}^3+3\,\dot{\bar{\mathrm{H}}}$, that it differs from the latter by one molecule of water only.

II. *Talc pseudomorphous after Pectolite.*

Occurs in the veins of calcite which traverse the trap rock in the vicinity of the Bergen Hill Tunnel, Hoboken, N. J. Structure radiate, forming arrow-headed masses. Folia easily separable, brittle and varying in length from 1 to 50mm; smooth to the touch, satin luster on faces of folia; crumbling quickly to an impalpable powder when crushed in the mouth, the powder being destitute of grittiness and with a faintly alkaline taste; subtranslucent on their edges, becoming translucent when wet.

H.=2·5. G.=2·565. Heated in closed tube blackens, gives much water, the vapor of which turns litmus paper blue, fumes when brought near a rod moistened with hydrochloric or acetic acid, and when collected by distillation gives with Nessler reagent a strong reaction of ammonia. Partially decomposed by hydrochloric acid, with separation of aluminic and ferric oxides. Iron reaction with microcosmic salt. B.B. darkens, then becomes white, slightly exfoliates and fuses at the ends of thin splinters to a greyish-white enamel. Gives with cobalt solution a pink color on ignition. Composition:

	I.	II.	Mean.	O ratio.
SiO_2	60·54	60·57	60·55	32·293
MgO	26·46	26·67	26·56	10·624
Al_2O_3	1·06	0·98	1·02	10·401
FeO	0·70	0·74	0·72	
MnO	0·55	0·76	0·65	
CaO	1·19	1·63	1.41	
H_2O	9·52	9·09	9·30	
	100·02	100·44	100·21	

O ratio for $\dot{B}$, $\ddot{S}i$ and $\dot{H}$ = 1:3:1, corresponding to the hydrous silicate $\dot{M}g^2 \ddot{S}i^3 + 2\dot{H} = SiO_2$ 60·8, MgO 27·0, H^2O 12·2 = 100. While closely approaching talc in its physical characters, this pseudomorph after pectolite is near sepiolite in its chemical composition.

III. *Leucaugite from Amity, N. Y.*

Occurs in rounded, undefinable prismatic crystals and coarse grains, along with seybertite, in calcite.

H. = 5·5. G. = 3·26. Luster vitreo-resinous, bright on cleavage surface; dull on fracture; color light-brown; streak white; translucent in thin splinters; fracture coarse granular; very brittle; B.B. fuses slightly on the edges becoming greyish-white; feeble iron reaction with microcosmic salt.

It resembles in color and general appearance the spinel occurring along with chondrodite and plumbago at Warwick, Orange Co., N. Y. It is likewise almost identical in composition, color, etc., with the leucaugite from Bathurst, W. Canada, described and analyzed by Prof. T. S. Hunt (Dana's Min., 5th ed., pp. 216 and 218). Composition:

		O Ratio.		O ratio.
SiO_2	50·05	26·693	30·030	2
Al_2O_3	7·16	3·337		
Fe_2O_3	0·56	0·504	15·093	1
MgO	14·48	5·792		
CaO	25·63	7·321		
H_2O	1·66	1·476		
	99·54			

This composition is that of a bisilicate of lime and magnesia, with some of the silica replaced by alumina. It is, therefore, an aluminous pyroxene of the formula $(\dot{C}a, \dot{M}g)(\ddot{S}i, \overset{...}{A}l\ \tfrac{2}{3})$, which is the formula of leucaugite.

IV. *Mineral associated with Corundum and approaching Ripidolite.*

Occurs at the Lesley farm (corundum locality), now owned by Messrs. Pusey & Ball, in Newlin Township, Chester Co., Pa. Encountered in a mass of about 30 lbs. at the borders of a great mass of corundum, of which about 60 tons (Jan., 1873) have now been laid bare. In the specimen from which the material used in the analysis was taken, the corundum is bordered by a soft mineral, which Dr. Isaac Lea pronounces "lesleyite" (App. Dana's Min., p. 18). It contains both lithia and potash. As it recedes from the corundum, the lesleyite alters in character, becoming white and diminishing in its potash percentage. The mineral analyzed contained no potash whatever, but abundant lithia.

H.=1·5–2. G.=2·718. Massive; color light olive-green; streak greenish-white; powder greasy; entirely decomposed by hydrochloric and sulphuric acids, the silica being left behind in an amorphous powder; in closed tube yields water; B.B. turns yellow from oxidation of ferrous oxide, but quite infusible; does not exfoliate; turns flame bright yellow (soda); with calcic chloride paste strong lithium band in spectroscope. Composition:

		O ratio.	
SiO_2	30·62	16·331	4
Al_2O_3	21·73	10·126	3
Fe_2O_3	0·42	0·378	4·84
FeO	5·01	1·113	
MgO	29.69	11·876	
Li_2O	0·11	0·058	
Na_2O	0·14	0·036	
H_2O	12·26	10·898	3·23
	99·98		

The small percentage of ferric oxide is due to a superficial oxidation of some of the ferrous oxide in the mineral, and is consequently calculated as protoxide. The presence of lithia, which I have not been able to detect in any of the accompanying ripidolites, and the unsatisfactory aspect of the oxygen ratio, forbid not only the supposition that this is a variety of ripidolite, but also that it is a new and independent mineral. It seems more probable that it is composed of one or more secondary products derived from a process of alteration. I am indebted for this mineral to the kindness of Dr. Isaac Lea. After arriving at these results, I learned from Dr. F. A. Genth that these minerals, associated with corundum, had been for a long time past the object of his studies, and we shall look with the greatest interest to the results of his investigations in this direction.

V. *Moonstone from Media, Delaware Co., Pa.*

H.=6·5. G.=2·59. Brilliant blue reflections from surface of principal cleavage; finely striated upon second cleavage surface; white, imbedded in white granular albite; closely resembles the peristerite of Canada.

Composition: SiO^2 67·70, Al^2O^3 19·98, Fe^2O^3 trace, CaO 1·47, MgO 0·11, Na_2O 8.86, K_2O 1·36, Ign. 0·08 = 99·56. Oxygen ratio for $\dot{R}$, $\bar{R}$ and $\bar{Si}$ = 2·951 : 9·310 : 36·126 or 1 : 3 : 12, which assigns to this variety of moonstone the normal composition of albite.

VI. *Antholite from the "Star Rock," Concord, Delaware Co., Pa.*

H. = 5–5·5. G. = 3·20. Luster vitreo-pearly; color yellowish-grey; streak dirty-white; broadly bladed and subfibrous, with evidence of incipient alteration; translucent; doubly refracting. An analysis gave:

		Oxygen ratio.	
SiO_2	55·12	29.396	29·652
Al_2O_3	0·55	0·256	
FeO	8·20	1·822	15·152
MnO	0·33	0·074	
CaO	0·75	0·214	
MgO	31·18	12·472	
K_2O	1·01	0·170	
Na_2O	1·55	0·400	
H_2O	2·21	2·044	
	100·90		

It is, therefore, a somewhat altered and hydrated bisilicate of lime and iron of the general formula $(\dot{M}g, Fe)\,\ddot{S}i$. In other varieties of this mineral, which in common unfortunately goes by the name "anthophyllite," the departure from the normal composition is still wider.

VII. *Wernerite from Van Arsdale's Quarry, Bucks Co., Pa.*

Occurs interpenetrated with sphene, cryst. graphite, pyroxene and oligoclase. H.=5·5. G.=2·708. Luster greasy; white, but with faint greenish tinge from admixed impurities; very translucent; structure columnar massive. Composition: SiO_2 47·47, Al_2O_3 27·51, Fe_2O_3 trace, MgO 1·20, CaO 17·59, Na_2O 3·05, K_2O 1·40, H_2O 1·48 = 99·70. Oxygen ratio for $\dot{R}$, $\dddot{Al}$ and $\ddot{S}i$ = 6·53 : 12·82 : 25·316 = 1 : 1·97 : 3·88. This ratio is unusually near the mean oxygen ratio of the least altered varieties of wernerite, and there appears no good reason for giving to this variety of scapolite from Van Arsdale Quarry, as has usually been done, the name of ekebergite.

Stevens Institute, April 7th, 1873.