ART. XLII.—*A New Chlorite from Northern Wyoming*; by
JOHN E. WOLFF.

IN December, 1910, the writer received from Mr. Albert F. Holden of Cleveland, Ohio, a talc-like mineral which he had in turn received from Mr. W. G. Swart, a mining engineer of Denver, as apparently containing a large amount of alumina. By correspondence with Mr. Swart it was ascertained that the mineral had been brought in by prospectors who were reluctant to disclose the actual place of the find but from whom finally the following information was obtained. To quote Mr. Swart's letter: "Location—Sheridan County, Wyoming. Occurrence—as nearly as I can make out from Mr. Heineman's description, it occurs in a vertical vein. He describes the exposed face as being 'as high as the office ceiling' and about 6 to 8 feet wide. The lines of fracture run vertically in the body of the mineral. This information was obtained by Mr. Parmelee, who originally brought me the mineral."

Sheridan County lies along the northern border of the state, a little east of the center, and includes in its western half the uplift of the Big Horn Mountains, in which the pre-Cambrian crystalline rocks are exposed. In the published reports these are described as mainly granite with some bands of schist, hence the only deductions possible from this scanty information is that the mineral occurs as a vertical schist band six to eight feet wide, representing either a shear zone or an integral member of a series of crystalline schists.

Description of the Mineral.

Macroscopic characters.—Several pieces were received, the largest a slab 7 in. long, 3 wide, and $\frac{1}{2}$ in. thick. The material is well foliated, with fine straight foliation planes like a roofing-slate, has a faint silvery green color and is decidedly translucent even in the thicker pieces, while thin splinters are colorless and almost glassy. The specimen is homogeneous and composed of minute parallel scales of the mineral.

Microscopic characters.—The thin sections confirm the purity of the material, for with the exception of a few minute prisms of zircon (?) and fluid cavities it is composed of sub-parallel plates of the chlorite, sometimes interlocking with a tendency to radial arrangement, with an average thickness across the base of $1/10^{\text{mm}}$ and diameter on the base of $2/10^{\text{mm}}$. No twinning is seen and no crystalline outlines, but a good basal cleavage.

Optical properties.—Dr. H. E. Merwin, of the Geophysical Laboratory, Washington, has kindly made the following measurements, entirely with the microscope:

$$\alpha = 1.580 \quad \beta = 1.580 \text{ to } 1.581 \quad \gamma = 1.589$$

with a possible error of ± 0.001 . 2E measured on several plates

about $1/10^{\text{mm}}$ in diameter varied from 26° to 50° , but the angle of most of the cleavage flakes is about 35° . The acute bisectrix, "Z," is inclined 5° to 10° to $\hat{c}$. On account of the indistinctness of the interference figures the dispersion of the optic axes could not be measured satisfactorily.

Chemical composition.—The following analysis (I) was made by the writer, employing the usual methods and determining the water directly by the Penfield method. No reaction was obtained for fluorine. To ascertain any difference in the state of the water given off above 110° the mineral after constant weight at that temperature was heated an hour at 250° to 300° without change and at 350° for half an hour with practically no change, the whole of the water going off at a white heat and hence considered water of constitution.

	I	Mol.	II
SiO ²	= 28.81	477	= 2 32.1
Al ² O ³	= 26.43	259	} = 1 18.5
Fe ² O ³	= 0.24	1.5	
MgO	= 31.21	773	} = 3 36.7
FeO	= 0.40	5	
H ² O			0.6
+ 110	= 12.62	700	} = 3 12.1
— 110	= 0.09		
Na ² O	= 0.35	5	
K ² O	= 0.14	1.5	
CaO	None		
	<hr/> 100.29		<hr/> 100.0

I. Chlorite from Wyoming. II. Leuchtenbergite, Mauléon, Delesse, Ann. Chim. and Phys., ix, p. 396, 1843.

Specific gravity (pycnometer) 2.702.

Pyrognostics.—Thin fragments fuse with difficulty in the blowpipe to a snow-white enamel and give intense blue with cobalt solution. Water given off in closed tube is neutral or very slightly alkaline. Slowly decomposed by boiling sulphuric acid and with difficulty by hydrochloric.

Conclusion.—The simplest empirical formula from the ratios of the above analysis is $\text{H}_6\text{Mg}_3\text{Al}_2\text{Si}_2\text{O}_{13}$. The leuchtenbergite from Mauléon, Pyrenees, of which only the old analysis of Delesse (II above) is available, seems to be the only chlorite containing as little iron, although the composition differs greatly by the excess of alumina in the Wyoming mineral, which amount is in fact exceeded by few chlorites. Although it seems hardly permissible to add a new name to the forty or fifty now found under the chlorite group, yet the purity of this material, its peculiar chemical composition and the certainty that it will be available in large quantity, perhaps justifies the name of "Sheridanite," from the county in which it occurs.

Mineralogical Museum, Harvard University.