McGOVERNITE, A NEW MINERAL FROM STERLING HILL, NEW JERSEY

C. PALACHE AND L. H. BAUER.

A mineral was found in the zinc mine at Sterling Hill in January, 1927, which cannot properly be classified with any species hitherto known. It was found in the North Drift, 900 foot level of the mine, and appears to have constituted the principal filling of a vein in massive ore.

The material is a rather uniformly granular mass of coarse grain, the individual grains showing a very perfect, almost micaceous cleavage. This cleavage and the deep red brown color of the cleavage plates in transmitted light, together with the reddish, somewhat bronzy color of the mass in reflected light, give to the mineral a very different appearance from that of any other of the related substances found there or at Franklin.

It proved on optical examination to be uniaxial, the cleavage being basal like that of friedelite; it is therefore probably hexagonal in crystallization. It is optically positive with $\omega = 1.754$. The specific gravity is 3.719.

Material for analysis was purified in the Harvard Mineralogical laboratory and the analysis was made in the laboratory of the New Jersey Zinc Co. under the direction of the junior author, with the following result:

	Per cent	Molecular Ratios	
SiO_2	8.92	.148	$= 3\times.049$
MnO	42.72	.603	
FeO	1.53	.021	$1.029 = 21\times.049$
MgO	11.27	.280	
ZnO	10.22	.125	
As_2O_3	4.45	.023	$= \frac{1}{2}\times.046$
As_2O_5	12.48	.054	$= 1\times.054$
H_2O	8.49	.472	$= 10\times.047$
	100.08		

These figures lead to no simple and satisfactory formula, the simplest expression representing the results of the analysis being: $21(Mn,Mg,Zn)O \cdot 3SiO_2 \cdot \frac{1}{2}As_2O_3 \cdot As_2O_5 \cdot 10H_2O$.

The presence of arsenic in this mineral in two states of oxidation was established by the following procedure. The powder is treated with $ZnCl_2$ and conc. HCl to repeated distillation at a temperature

not exceeding 115°C. All As_2O_3 is thus transferred to the condensing flask where it is determined by titration. The residue in the flask is reduced with filter paper, CuCl, and more conc. HCl, any As_2O_5 present thus being changed to As_2O_3, which is then determined by a repetition of the first process.

The mineral most nearly resembling this one in appearance and physical properties is dixenite, described by Flink from Långban, Sweden. To it has been assigned the almost equally complex formula: $21(Mn,Ca,Fe)O \cdot 4SiO_2 \cdot 4As_2O_3 \cdot 5H_2O$.

No attempt will here be made to transform either of these empirical formulae into a more intelligible form. Material is accumulating from the study of Franklin and Sterling Hill occurrences tending to show that these two minerals are part of a group together with friedelite, schallerite and some intermediate members. A full discussion of this relationship is reserved for a future paper when the material has been more fully elaborated.

The authors take much pleasure in naming this new mineral for J. J. McGovern, for many years the foremost of local collectors at Franklin, who died in 1915. From his place of duty at the picking-table at the shaft-head his keen eyes enabled him to save many a rare specimen from going to the crusher; and as he was always ready to place his discoveries in the hands of scientific mineralogists for study, he added largely to our knowledge of Franklin mineralogy.

OPTICAL NOTES ON SOME OF THE VARIABLE CONTACT MINERALS FROM EDENVILLE, NEW YORK

M. J. BUERGER, *Massachusetts Institute of Technology.*

The writer has recently completed a brief study of the optical properties of some of the contact minerals from the limestone near Edenville, New York, and since the constants of several of these variable species differ from those recorded in standard reference books, it seems of interest to record the data obtained. The specimens were collected in August, 1925, by Dr. Joseph L. Gillson. Referring to the U. S. Geological Survey topographic sheet of the Goshen, N. Y., quadrangle, the specimens were taken from a stone fence near the road forks marked 451 (elevation), a little over a mile northwest of Edenville. Actual contact exposures are poor.