

A NEW VARIETY OF KOBELLITE.*

BY H. F. AND H. A. KELLAR.

In the mines of the Lillian Mining Co. on Printerboy Hill, near Leadville, Col., a mineral consisting essentially of the sulphides of Pb, Ag and Bi has of late frequently been met with. It occurs in nodules of different sizes, attaining occasionally a diameter of several feet. They are, as a rule, considerably oxidized into an irregular mixture of Pb SO_4 and $\text{Bi}_2 \text{O}_3$, leaving often but a black kernel in the interior, assaying as high as 9000 and more ounces Ag per ton. The mineral is always found in the lead-bearing streak and mostly near its top against the porphyritic hanging wall.

The undecomposed mineral is of a steel-grey color, finely grained, crystalline, with metallic lustre, and gives a dark grey to black streak. It is invariably mixed more or less intimately with PbS and not unfrequently also with Fe S_2 and ZnS. The first piece coming under our observation appeared to be just such an intimate mixture of fine and coarser grains, the latter of which showed the lustre and cubical cleavage of Galenite. A portion of it was analyzed with no attempt at separating, the result corresponding closely to the formula $12 (\text{Pb, Ag}_2) \text{S. Bi}_2 \text{S}_3$. Further analyses from different portions of the piece convinced us that the above was merely an accidental result, the true silver mineral being of a less basic character.

It is perhaps worth mentioning here, (1) that all samples from this piece showed the characteristics of Galenite in that on treating the finely powdered substance with HNO_3 small portions remained for a long time unoxidized in the Pb SO_4 formed; (2) that with an increase of Pb our analyses showed, as expected, a decrease of Ag, the pure PbS from the above mines being rather low-grade in respect to Ag.

Through the kindness of Messrs. C. T. Carnahan and H. E. Wood, of Leadville, we were able to obtain better material for investigation. Several new pieces of ore which under the lens appeared in portions quite homogeneous were carefully broken, picked, further

* See also *Eng. and Mtn. Journal*, Vol. XI., page 20.

reduced, again picked with the aid of a lens and finally analyzed, with the following results :

	I.	II.	III.
S	15.21	15.27	15.19
Pb	43.94	44.28	44.08
Bi	32.62	33.31	33.89
Ag	5.78	5.40	5.72
Cu	Trace	0.03	Trace
Gaue.	0.15	0.14	0.17
	97.70	98.52	99.00

together with traces of Fe and Zn. In our first analysis the Bi is probably too low. The loss in the other two we believe to be due to a slight volatilization of Pb and Bi, caused by reduction of the sulphate and oxide, respectively, adhering to the filter paper, or to an incomplete oxidation of the S.

The formula of the mineral, $3(\text{Pb}, \text{Ag}_2) \text{S} \cdot \text{Bi}_2 \text{S}_3$, would be that of Kobellite [$3 \text{Pb S} \cdot (\text{Bi}, \text{Sb})_2 \text{S}_3$] differing principally from the latter by the absence of Sb. Similar silver—bismuth minerals, also from Colorado, have been described by Drs. F. A. Genth and G. A. Koenig, of the University of Pennsylvania, under the names of Schirmerite, Cosalite, Alaskaite and Beegerite.

THE "LALANDE-SPENCE" PRIMARY BATTERY.

BY JAMES H. STEBBINS, JR.

The following extracts are taken from the description of this battery as given by the owners of the patent :

"The cell is composed of a stamped iron tray, on the bottom of which is sprinkled some oxide of copper. The cell is then half filled with a solution of caustic soda at a certain degree of density, and a plate of zinc is immersed in the solution." * * * * *

"There is practically no waste going on in the cell, unless work is being done." * * * "All necessity of removing the zinc plates from the liquid is thus avoided. The action of the caustic soda upon the zinc is entirely uniform ; no honey-combing of the plates takes place." * * "A steady current is given off, and there is practically no polarization, so far as can be ascertained. The electromotive force is very nearly one Volt, and this, combined with the extremely low resistance of each cell, gives a remarkably efficient