Sierra County

Small amounts of tetradymite and free gold were shown in vein material from a surface trench on the Copper Flat mining claims, Hillsboro mining district.[13]

Calaverite, petzite, and sylvanite were reported present in ores from the Lookout mine, Tierra Blanca district, but no investigation of the tellurides was made until 1931 when G. T. Harley collected a small suite of specimens from the Lookout. The only telluride identified by Mr. S. G. Lasky in this suite was hessite. Lasky found native gold, younger than the silver telluride, traversing the silver telluride in minute veinlets.[14] The gold was present in varying amounts and perhaps explains the gold-silver tellurides reported in the earlier mined ores. The deposit is exhausted.

Taos County

Petzite[15] has been reported from several mines in the Red River District. It is said to have been present in siliceous ore from the Sampson mine and in some of the ore from the Memphis mine. Quartz boulders containing a mixture of pyrite and a telluride were found in the Independence mine in 1904, and is the first reported occurrence of a tellurium mineral in New Mexico. "Qualitative tests showed the presence of tellurium but the telluride, small lustrous grains of dark-gray color, was so intimately associated with the pyrite that a separation for analysis was too difficult." A specimen from the original find is now in the possession of Mr. Wm. Earle and shows grains of native gold included in the telluride. The mineral in this hand specimen resembles petzite but as Mr. Earle was unwilling to sell or loan the specimen for polishing, microscopic examination was impossible. Most collectors of tellurides will have a kindred feeling for Mr. Earle.

A NEW OCCURRENCE OF GYPSUM IN KENTUCKY

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Many small deposits of gypsum have long been known in Kentucky; some of the most notable being those found in the limestone caves of Edmonson County, and other caves of the western part of the State. Richardson[1] lists a few of the occurrences more widely known, such as

[13] Harley, Geo. T., The geology and ore deposits of Sierra County, N. M.: *N. M. Bur. of Mines and Min. Res., Bull.* **10,** p. 164, 1934.

[14] Harley, G. T., *op. cit.*, p. 109.

[15] Lindgren, Graton, and Gordon, *op. cit.*, pp. 87–88.

[1] Richardson, C. H., Mineralogy of Kentucky: *Ky. Geol. Sur., Ser.* **6,** pp. 85–87, 1925.

the bedded deposits in the Niagaran shales on the eastern flank of the Cincinnati Arch, and the occasional crystals found in the cavities of the iron ores which occur in widely separated regions over the State.

The deposit under discussion is thought to be somewhat unique, although similar occurrences are known in other regions of the United States. In the early part of 1937, Mr. D. J. Jones, State Geologist of Kentucky, was asked to identify some crystals from the White City Mine of the Hart Coal Company near Morton's Gap in Hopkins County, Kentucky. The mineral proved to be selenite crystals of unusual development compared to those found elsewhere in Kentucky. Further investigation by Mr. Jones and the writer, with a visit to the mine, disclosed an abundance of this mineral in an air entry of the coal mine.

The Hart Coal Company is mining at present the No. 11 coal, in the White City Mine. A few feet above this coal lies the No. 12 seam, the interval between the two seams being occupied by the Providence limestone of Allegheny age. The section from the top of No. 11 coal to the base of No. 12 is as follows:

		Ft.	In.
BASE:	Top of Coal, No. 11		
(1)	Clay, soft, fine-grained, dark red, sour taste; gypsum crystals	1	2
(2)	Limestone, massive; crystalline at base, but beoming very shaly in top 6 inches (Providence)	1	6
(3)	Clay, soft, tobacco brown; many gypsum crystals, and limestone fragments; decidedly sour taste	0	6
(4)	Clay, soft, light gray; probably fire clay; sour taste	1	2
TOP:	Base of Coal No. 12		

It is believed that this occurrence of gypsum is a result of the common reaction of acid waters from a coal seam with a limestone. The acid water resulted from the oxidation of iron pyrite contained in the coal.

In the case under discussion, both Coal No. 11, below, and Coal No. 12, above, are potential sources of supply.

It will be noted that there is a clay zone immediately underlying, and overlying, the limestone bed. Within these two zones the well developed selenite crystals are found in profusion.

The position of the two clay zones above and below the limestone suggests two possibilities concerning the movement of the acid solution. First, it is possible that there have been two sources of acid: that is, it may have been derived not only from the upper coal but also from the No. 11 seam below. In the former case, any acid which formed in Coal No. 12 probably percolated downward into the upper layers of the Providence Limestone, with the resultant formation of selenite crystals. In the latter case, the sulfuric acid formed in Coal No. 11 was brought in contact with the overlying limestone through capillary action.

The second hypothesis is that all of the sulfuric acid responsible for the leached zones in which the selenite occurs has been formed in the upper seam, or Coal No. 12, and has seeped downward; a portion of the acid reacting with the top part of the limestone, and the remainder of the solution descending through open joint planes of the bed until reaching the bottom layers. In this case, the lower coal bed, No. 11, probably acted as a relatively impervious stratum, causing a concentration of the acid solution on its upper surface.

The writer is inclined to believe that the latter alternative fits the observed conditions, because of the open character of the joint fractures which permit free passage of the acid waters downward to the base of the limestone bed. Additional support for this hypothesis lies in the fact that concentrations of crystals seemed to occur at the intersection of joint planes with the leached zones above, and below, the limestone horizon. Also, the joint planes are filled with the same brown ferruginous clay as that associated with the upper and lower surface of the limestone, thus indicating additional acid leaching as it passed downward through the bed.

Some suggestions have been made that the crystals may have formed at the same time as the limestone. The fact that many of the crystals contain inclusions of clay, and the occurrence of two zones of the selenite above and below the limestone, seems to prove their secondary origin conclusively. Furthermore, the clay residue possesses a distinctly sour taste which probably indicates a considerable acid content now present in the rock. In fact, it is entirely possible that the selenite is being formed today.