

## Antimony Veins at Bernice, Nevada

By Willard Mallory

**GEOGRAPHY.** The Bernice mining district on the western slope of the Clan Alpine range, Churchill county, Nevada, is 40 miles north-east from Wonder and 70 miles south-east of Lovelocks. The district is served by freight-team from Fallon, Nevada, a distance of 90 miles and a good day's drive by automobile. At present there are two producing mines: the Antimony King mine at Bernice, and the Lofthouse mine 5 miles south-west. The greatest local elevation is Grant's peak, 7500 ft., eight miles south-west of Bernice. From this point the western slope of the range descends rapidly to 4000 ft. and then gradually to the floor of Dixie valley, said to be 2800 ft. above sea-level, the lowest point in the State. Sedimentary rocks are well represented in the district, flanking the intrusive granite or monzonite that forms the crest of the range. The upturned edges of the tilted strata appear along the trend of the ranges. The predominating strike is north-west and south-east across the trend of the range, the dip being north-east.

**ORE OCCURRENCE.** The lower slate member of the sedimentary series is the only formation important as a source of antimony. All the mines or prospects examined occur within this horizon. The rock is an indurated shale, weathering yellowish to reddish-brown in color. Highly developed cleavage in two directions at high angles to the bedding causes it upon weathering to break into small thin shingles and pencils. Igneous rocks are conspicuously absent within this horizon.

Stibnite, the sulphide of antimony, is the only ore of commercial importance. Cervantite, the yellow oxide of antimony, forms thin coatings on the stibnite at the surface and massive thicknesses, eight to ten inches, in the weathered sections of some deposits, but this mineral quickly gives place to stibnite below the surface. One low-grade deposit carrying disseminated stibnite in quartz was observed, showing yellow altered surface material for a depth of six feet.

Antimony occurrences throughout this district are closely associated with isolated limestone strata. At the Antimony King mine there are two of these strata averaging 8 ft. wide and 300 ft. apart. They have the same strike and dip as the enclosing slate, and their trend is marked by prominent outcrops. The most persistent stratum is traceable for three miles. This rock is a fine-grained silicious limestone, massive and bluish-gray. It contains small cubes of disseminated pyrite. Normally it weathers grayish-white, but in some sections for continuous distances of a quarter of a mile these croppings are stained yellow by antimony oxide. Numerous prospect-holes furnish unaltered exposures showing specks of stibnite through the mass of the rock, also thin sheets of crystalline stibnite in cleavage and joint planes, but these antimony-bearing limestones do

not furnish ore in any commercial quantity, as so far noted.

**ANTIMONY KING VEIN.** The Antimony King vein is a true fissure with quartz-filling. It cuts the slate at nearly right angles and intersects the two limestone strata. It can be traced on the surface for 900 ft.; strike N 10° E, dip 50° W. The quartz-filling is from 4 inches to 4 feet wide, any portion of which may be replaced by solid stibnite. Both walls have a parting of black slaty gouge. The slate wall-rock is altered and carries disseminated cubical pyrite. Sphalerite is the only associate of the stibnite in the vein itself; it occurs but sparingly and at wide intervals.

This vein is regarded as remarkably persistent for an antimony deposit. The best ore-shoots occur south of the intersection of the vein with the southern limestone stratum. Here the lower drift has opened up the vein continuously for a distance of 200 ft. to a depth of 100 ft. A faulted segment of the limestone strikes nearly parallel with the vein at this intersection, and for a distance of 70 ft. this segment has become incorporated into the lode, forming a 'lime spur' lying next the hanging wall. The best orebodies occur in the quartz under this lime spur, where solid stibnite in widths up to 2 ft. has been discovered and mixed massive stibnite and quartz in widths up to 4 ft. This 'spur' feathers out on the south strike of the vein and the ore becomes less massive in character, showing a banded structure of alternate stibnite and quartz. Northward through the slate the vein, though small, continues with occasional good shoots of ore until it intersects the northern limestone stratum, beyond which it is apparently barren.

A genetic relation between the limestone and the orebodies is strikingly shown in the vein described, and is apparent throughout the district. The Lofthouse mine, six miles south of Bernice, is noteworthy in this respect. The vein is a fissure with quartz-filling and has the same direction of strike and dip as the Antimony King. The limestone stratum associated with it is the only one in an immense thickness of enclosing slate. In this mine the ore is less massive, occurring in fibrous and needle-like forms. Another illustration is furnished by a prospect a mile north of Bernice. Here an erratic quartz stringer, six inches wide, originates in the slate and intersects nearly at right angles a limestone stratum 10 ft. wide. On both sides of the lime the quartz is barren, but where it passes through the lime it widens to 8 inches and nearly all the quartz gives place to coarse fibrous stibnite.

In conclusion, the antimony deposits of merit or promise are essentially quartz-filled veins in slate, but deposits of importance have been found only where such veins are associated with silicious limestone.

ARIZONA has an area of 113,020 square miles, which is nearly twice that of Michigan. Its population of a quarter of a million is about that of Denver. Arizona's output of gold, silver, copper, lead, and zinc in 1915 was \$88,551,000.



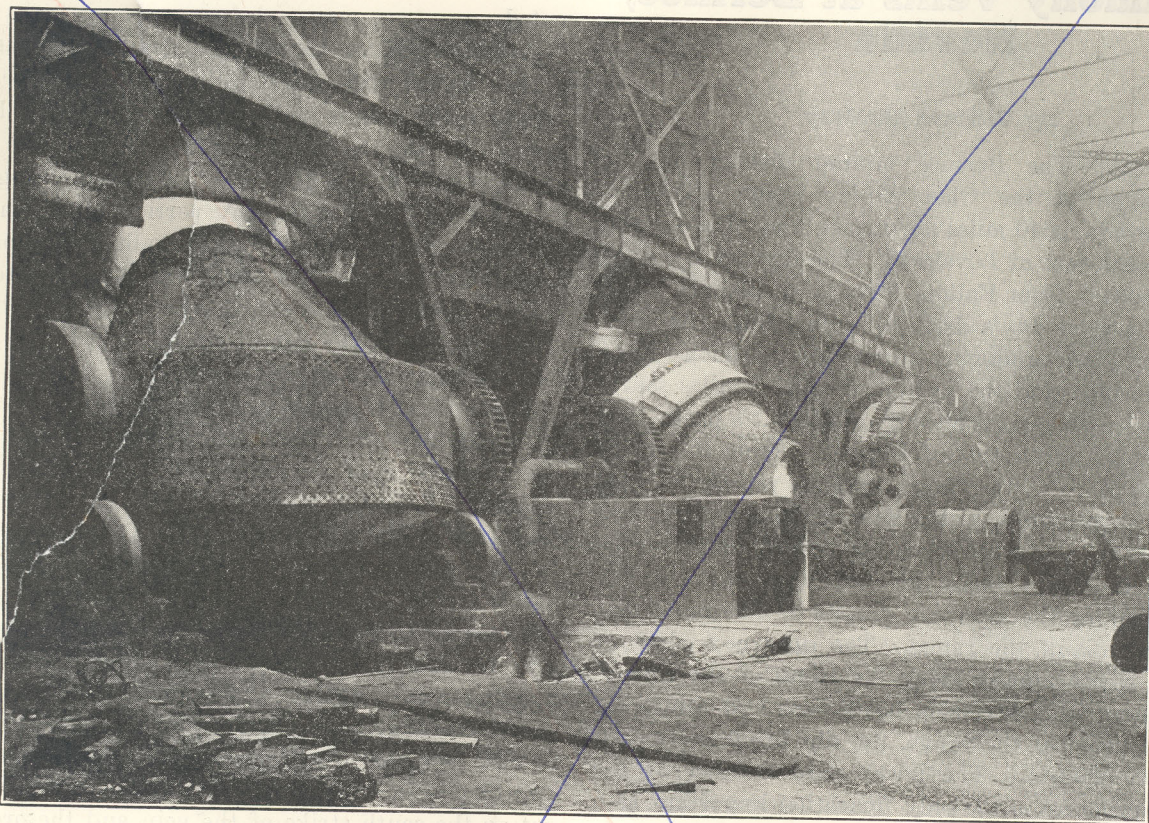


FIG. 13. TWENTY-FOOT CONVERTERS, ONE BLOWING, ONE POURING.

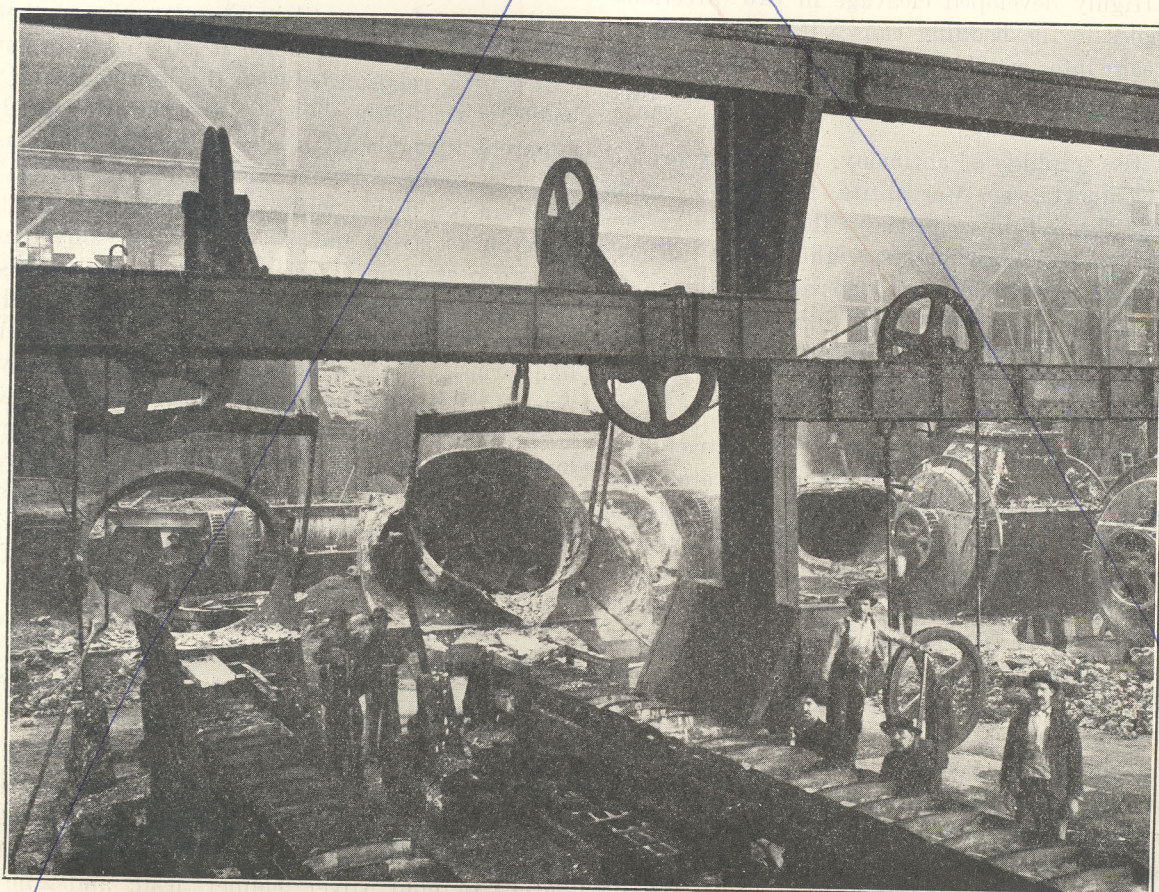


FIG. 14. CASTING CONVERTER SLAG AT THE CONVERTER BUILDING.