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CASTLE CREEK DISTRICT

Topography

The Castle Creek district lies in the southwest corner of the Bradshaw Mountains quadrangle. On the south and west it is adjoined by the Red Picacho, White Picacho, and Black Rock (Constellation) districts, which lie just outside the quadrangle. The Castle Creek District is difficult to reach; it is best accessible from Wickenburg, the distance being about 18 miles in straight line and in a northwesterly direction. A poor wagon road leads from Wickenburg to the Abe Lincoln mine, and thence trails continue to the Swallow mine and across Castle Creek to Copperopolis. A wagon road is supposed to follow Castle Creek from the Hot Springs up to Briggs.

Castle Creek is a deeply incised stream which after flowing in a southeasterly course for about 25 miles enters Agua Fria River at the extreme south corner of Yavapai County. On Castle Creek a few miles south of the border line of the Bradshaw Mountains quadrangle are the Castle Hot Springs (altitude 1,684 feet), a well known resort embowered in a grove of date palms and yuccas. The whole region is intensely dissected by a rather mature network of gulches intrenched between abrupt ridges from 1,000 to 1,500 feet high. Travel along the trails is difficult and arduous, and the summer climate is extremely hot. The vegetation is that characteristic of the hot belt and consists mainly of mesquite, palo-verde, palo-blanco, and prickly pear.

Geology

Much of the district is covered by tertiary volcanic flows, including volcanic agglomerate, andesite, and rhyolite tuff. These materials were poured out on the pre-Cambrian deeply eroded basement and are now dissected by the post-tertiary erosion. The flows reach up to an altitude of about 3,500 feet, and between Wenton's and Donnelly's to 4,500 feet. North of the

#2. Castle Creek district

flows the southwestern outliers of the Bradshaw mountains rise abruptly to 4,500 feet, and their brushy ridges connect with the complexes of Silver Mountain, Minnehaha, and Crown King.

The pre-Cambrian consists of a belt of Yavapai schist trending diagonally to the southwest corner of the quadrangle. On both sides of this is normal Bradshaw granite and in places the mixture of schist, diorite, and granite known as the Crooks complex.

The ore deposits are confined to the pre-Cambrian and include a few placers, now exhausted, the best of which were worked in American gulch north of Brigg's ranch; pre-Cambrian gold quartz veins, represented by the Lehman deposit; gold-copper veins, deeply oxidized, with chrysocolla and specularite and in places carrying gold and silver, exemplified by the Swallow, Whipsaw, Jones, and Copperopolis properties; and lead veins, represented by the long vein that trends westward from Copperopolis.

Regarding the affiliations of the gold-copper veins and the lead veins there is much uncertainty. The only verdict possible is that they are pre-Tertiary. The copper-bearing veins differ from those seen elsewhere in that the oxidized ore always contains much bright-blue chrysocolla, intergrown with specularite in thin plates.

A supergene origin is ascribed to the specularite because of its very intimate intergrowth with chrysocolla. As shown in Plate 15, A, it develops in the copper silicate as minute radiating plates, many of which follow the direction of cracks in the chrysocolla. It is believed that this peculiar variety of oxidized ore owes its origin to the higher temperatures prevalent in this district of low altitude (1,500 to 3,000 feet.)

Owing to the situation of the district the production has naturally been small. Some rich ore has been shipped, and some ore has been milled at the Lehman and Whipsaw mills. The total production is probably well below \$500,000, gross value.

#3. Castle Creek District.

A little smelting plant was erected many years ago at Briggs to treat Copperopolis ore, but there is no record of production.

Lately 800 acres of nitrate land has been located just north of Briggs on volcanic agglomerate and rhyolite tuff. It is not unlikely that the tuff has yielded traces of nitrate, but the probability that commercial deposits will be developed here is very small.

SWALLOW MINE

The Swallow mine, owned by John Dobler, is at an altitude of 3,225. The place is also known as Buzzard's Roost. It is accessible from the Abe Lincoln mine, 12 miles from Wickenburg, by a road in poor repair leading down Whipsaw Creek and thence north to the head of a small gulch leading down to Castle Creek. The mine is half mile west of the Bradshaw Mountainst quadrangle, in the Congress quadrangle, but it is described here, being in the Castle Creek district. There is a 10-stamp mill on the property.

The country rock is Bradshaw granite with dikes of andesite and granite porphyry. Half a mile southeast of Buzzard's Roost in the south shaft, 225 feet deep. The vein strikes N.10° W. and dips 70° E. The best ore, which is a copper-stained rusty mass with chrysocolla and brown copper pitch ore, contains 1 to 2 ounces of gold to the ton. The ore averages 3 to 15 feet in width, and much of this has been milled. The ore on the dump carries about 8 per cent of copper and several dollars in gold to the ton.

North of the house and 300 feet above it is a shaft 300 feet deep and presumably on a different vein. Much ore has been stoped to points 150 feet north and 50 feet south of this shaft. The vein strikes N. 33° W. and dips 60° E. Another vein is found 100 feet north of this deposit. Still farther north and above the shaft is a tunnel driven on the same or a parallel vein.

#4. Castle Creek District

The vein is several feet wide, and the oxidized filling shows mainly platy specularite with oxidized copper ores, quartz, calcite, and some fluorite. It has been mined as a gold ore with free gold in the well-oxidized material. undoubtedly poorer ore with less free gold will be found in depth.

A specimen of bismuthinite altered to bismuth ocher, said to have come from this mine, was obtained from Mr. Dobler.

Along the trail from the mine to Briggs, on Castle Creek, another parallel vein crops out, showing oxidized ore with some copper and dipping steeply west.

WHIPSAW MINE

From Castle Creek a road in poor condition leads up west to the Whipsaw mine, at an altitude of 3,200 feet, on Whipsaw Gulch. Fine-grained amphibolite crops out near Castle Creek; the mine is in schist. The deposit is a vein a few feet wide with northwest strike and southwest dip. The oxidized ore carries gold and copper. Chrysocolla, limonite, and specularite are the minerals observed. The mine is developed by a shaft a few hundred feet deep. In 1890 a smelter was erected on Whipsaw Creek to treat the ore from this deposit. Probably it was not in operation for a long time.

OTHER PROPERTIES

On the south side of Whipsaw Creek is the Dummy, a vein with soft oxidized ore carrying gold and copper. An old gold mill imported from California was erected to treat the ore from this property.

On Buckhorn Creek $1\frac{1}{2}$ miles above Buckhorn Spring is a gold-bearing vein with some lead. It is owned by Mr. Wisnerat. The ore was treated in an arrastre in the eighties. In 1922 it was under lease to Sharp & Myers. This is said to be a vein 16 inches wide striking northeast, in diorite, and to be developed by a 100-foot shaft. The vein is said to be rich in spots.

#5. Castle Creek District

CHAMPIE (LEHMAN) COPPER MINE.

A deposit on which considerable work has been done lies half a mile west of Copperopolis, at an altitude of 3,400 feet. A road extends up to it from Briggs, on Castle Creek. The deposit is in amphibolite schist, injected with pegmatite and tourmaline quartz. It is developed by four tunnels within a vertical interval of 200 feet. As far as could be seen the vein strikes N. 20° W. and dips 45° SW. The lowest tunnel is caved. The ore consists of brown limonite with chrysocolla and specularite. The mine was developed by Gus Lehman, who shipped no ore. In 1917 E. C. Champie is said to have shipped four carloads of 20 per cent ore, hauling it to Hot Springs Junction, a distance of 34 miles.

On the trail from Lehman's mill to Copperopolis are several prospects with similar ore. One of them showed 1 foot of chrysocolla ore in a vein along an andesite dike in schist and pegmatite.

COPPEROPOLIS

The locality with the ambitious name Copperopolis is 2 miles northeast of Briggs, at an altitude of 3,200 feet, at the north edge of the tertiary lava and at the foot of the granite mountain that rises 1,300 feet above the town site. At present there is just one house in the town, and that is deserted.

The remarkable outcrops at this place long ago attracted attention. At present the five or seven claims are said to be held by R.D.O. Johnson and looked after by Dr. Morrison, of Phoenix.

There are two prominent outcrops at Copperopolis. The upper one is 1,000 feet north of the town and is trenched 100 feet deep by Copperopolis Creek. It is developed by irregular workings and a 200 foot shaft, sunk in 1880 and now caved. The country rock consists of granite and pegmatite, greatly oxidized. The ledge seems to be 100 feet wide with many seams. It strikes N. 60° W. and dips southwest. The ore consists of limonite and

#6. Castle Creek District

and bright-blue chrysocolla. Some ore is said to have been shipped to the Briggs smelter and some shipped to outside points. The production was probably small.

Below this outcrop the rock is andesite for 400 feet, to the point where the so-called "great lead vein" crosses. This is a zone perhaps 75 feet wide and whether the country rock is andesite or granite could not be definitely decided. At any rate the ledge matter contains granitic material. An old tunnel opening this lode from creek level is caved, but on the dump is a considerable amount of black oxidized lead ore, probably carbonate and sulphate mixed.

This lead vein crops out also in the low saddle half a mile toward the west, where it strikes about N. 70° W. A little work has been done here, but the openings are caved. The ore shows galena and agglersite with some manganese dioxide in barite gangue. The width is not shown but is probably 8 or 10 feet. The ore is said to assay about 4 ounces of silver to the ton. More work has been done on this vein a mile further to the west, and it is said to be traceable to Crown Point, in the Congress quadrangle.

High on the shoulder of the granite mountain rising north of Copperopolis, which might well be called Lehman Mountain (altitude 4,400 feet), is Lehman's gold quartz mine. For many years this was owned by Gus Lehman, a pioneer of the district, who died in 1914, perishing of thirst on the desert between this place and Phoenix. At present the property is held by E. C. Champie. The exact location is a quarter of a mile due east of the gap just north of Lehman Mountain, and the altitude is about 4,200 feet. The trail leading up from Copperopolis ascends 500 feet over andesite to a point where the granite crops out.

#7. Castle Creek District

The developments consist of two tunnels, 40 and 100 feet below the outcrop. Some ore has been extracted and packed on burros to the 5-stamp mill on Spring Creek indicated on the map. The country rock is granite with some pegmatite and schist. The strike of the veins is N. 10° W., and the dip 25° W. The upper workings show three parallel veins close together, 2 feet, 6 inches, and 6 inches wide. The ore is a massive glassy quartz, stained by limonite and corroded by descending waters. There are no sulphides left, but much fine-grained tourmaline is intergrown with the quartz.