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Churchill Co.
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Item 11

DEPARTMENT OF THE INTERIOR

Geological Survey

September 15, 1927.

Chalk Mountain, Quartz Mountain, Gold Basin, and

King Mining Districts, Nevada.

The Chalk Mountain and Quartz Mountain mining districts are in southwestern Nevada southeast of Fallon, the nearest railroad station, to which the ore is hauled by autotrucks over the Lincoln Highway and thence shipped to Salt Lake City, Utah. The districts have recently been brought into prominence by the discovery of valuable ore bodies. This general region was examined by the Geological Survey several years ago, but in view of the recent discoveries and considerable production another visit was made in October, 1926. The work was done by F. C. Schrader, geologist, who received valuable aid and information from the local mining companies. The deposits occur mostly in Triassic (?) limestone and are associated with porphyritic intrusive rocks, like the ores of Tintic, Utah, and Leadville, Colo.

(3)

Chalk Mountain District

The Chalk Mountain district is about 40 miles east-southeast of Fallon, in Churchill County, midway between the famous old Fairview and Wonder districts. (See fig. 2.) Chalk Mountain, in which nearly all the ore occurs, is a conspicuous whitish hill in Fairview Valley. It is about 3 miles long, in a north-northeast direction, and 2 miles wide, and it rises to an altitude of 5,440 feet, or about 1,000 feet above the surrounding surface. (See fig. 3.) It is separated from the west front of the Westgate Range, which contains the eastern part of the district, by a valley about a mile wide.

Geology

Chalk Mountain consists mainly of whitish dolomitic limestone which has been arched into an anticlinal fault block along its longitudinal axis and intruded by granodiorite porphyry. The limestone contains the ore deposits. It is medium to thick bedded and is more or less marmarized. It has been faulted, sheeted, and locally intensely folded. Pronounced faults occur along the east front of the mountains, and with them is associated the principal zone of mineralization. Faulting and mineralization have occurred also on the west slope, in a cross zone, or "iron belt," nearly a mile south of the north end, and across the south end. Along the contact the granodiorite porphyry has changed the limestone into dolomitic marble and produced a contact-metamorphic zone, in places several hundred feet wide, containing a score or more of the usual metamorphic minerals and also bodies of ferruginous magnetic greenstone or low-grade iron ore, with which copper minerals are associated. Epidote, a green calcium-aluminum silicate, occurs in large bodies on the west slope of the mountain, and large masses of phlogopite, a light-gray, pearly-lustered magnesium mica, are found at the southeast base. No fossils indicative of its age have yet been found in the limestone of Chalk Mountain, but because of Jurassic fossils found in limestone in the foothills to the south and in the adjacent part of the Westgate Range, and because of the more highly metamorphosed character and dynamically shattered condition of the limestone in Chalk Mountain, it is thought to be probably of Triassic age and to belong to the formation that occurs 12 miles to the north, in the Stillwater Range, and was described by the Fortieth Parallel Survey as the Koipato series.

The granodiorite porphyry, with which the ore deposits are genetically connected, is a medium-grained gray porphyritic rock composed chiefly of soda-lime and alkali feldspars, quartz, biotite, and hornblende.

The limestone and granodiorite porphyry are intruded by dikes of a greenish iron-gray diorite and a whitish aplite, which are presumably complementary to each other and have been differentiated from the granodiorite porphyry magma. In places ore deposits are associated with these dikes.

At the north end of the mountain the limestone and the granodiorite porphyry are mostly covered by rhyolite, a light-colored siliceous volcanic rock. On the northeast slope occur two small areas of a dark-greenish iron-gray andesite, and a small belt of the andesite crosses the south base.

Just north of Quartz Mountain, on the Nye-Mineral and other claims, are prospects on several fault breccia veins in the rhyolite (flow No. 4 in the section accompanying fig. 1) in which a little galena and lead carbonate occur. The San Felipe prospect, three-quarters of a mile northwest of Quartz Mountain, is opened 145 feet deep in rhyolitic rocks. It was supposed to be on the continuation of the Vertical vein, which recently, however, has been found to have a more westerly course. A little mineralized rock was found which assayed about $2 in gold and silver to the ton, but the prospect is not encouraging.

The outlook for the Quartz Mountain district is regarded as favorable. Its best probability is that of finding further ore deposits in the limestone. There is also a fair measure of probability that new deposits may be found in the large area of volcanic rocks extending from Quartz Mountain to Broken Hills. Owing to the irregularity in occurrence and the replacement character of the deposits, the best guide in prospecting is to follow mineralization in the limestone. The most promising places are on or near the contact of the limestone with the intrusive rocks, especially granitic rocks, as granodiorite porphyry and quartz monzonite. The larger the intrusive body the more chance there is of discovering an ore deposit.

Promising platinum deposits are being developed south of Lodi Tank. High-grade scheelite deposits are being developed in Cottonwood Canyon, east of Lodi. The Illinois mine has recently opened up a large body of high-grade silver-lead ore.

Churchill County

Gold Basin District

The Gold Basin district is 45 miles southeast of Fallon, 5 miles south of Chalk Mountain, and just east of Fairview Peak. (See fig. 2.) It is a north-south area 3 miles long by 2 miles wide, which drains northwestward into Fairview Valley. The surface consists mostly of steep ridges and deep valleys eroded in faulted and folded Tertiary volcanic rocks. The predominant rock is a dull-gray quartz latite like that of the Wonder district, where it is commonly called a rhyolite.

The ore bodies are principally gold-bearing deposits such as commonly occur in veins in Tertiary volcanic rocks of the Southwest. They contain a little silver besides the gold. Outside the veins free gold in fine particles is widely distributed in nearly all the rocks, but it is not recoverable. The deposits occur mostly in eight or ten veins or breccia zones, which in general contain but little quartz or gangue mineral other than wall-rock breccia. The deposits were formed by hot ascending magmatic solutions that circulated through the rocks soon after the eruption and consolidation of certain members of the volcanic group. They were probably deposited mostly as argentite and gold. Since they were formed the deposits in the oxidized zone have been enriched by downward concentration of detrital mineral, especially gold leached from the disintegrated veins and rocks of higher levels removed by erosion. For this reason the deposits pan well in free gold.

The Gold Bug mine, owned by the Gold Bug Mining Co., lies near the south end of the district, at an altitude of about 5,400 feet, on a fault-breccia vein or zone that dips about 50° NE., in andesite. The vein, which was discovered by Henry Knight in 1924, is 2 to 6 feet wide and 1,700 feet long. It is opened by a 40° inclined shaft with two 50-foot drifts on the 50 and 100 foot levels and seems to persist still farther downward. It consists mainly of gray fault-brecciated andesite, partly replaced by vuggy quartz stained by iron and manganese oxides. In places it is fairly siliceous, and its metal content, mostly free gold, is as much as $20 to the ton. The ore contains also a little argentite and cerargyrite.

In Branch Canyon, about 1½ miles north of the Gold Bug mine, are five or six prospects in the quartz latite, mostly owned by Messrs. Branch, Hunt, Smith, and Wilson. The Smith prospect, situated on a hill toward the east, consists of a fault-breccia ledge or zone 2 to 4 feet wide, dipping 70° E. It is opened by a 35-foot shaft which shows only brecciated country rock, with but little quartz, silicification, or indication of mineral. The rock, however, pans well in gold, which is in very small particles and most of which has probably been concentrated in the ledge by leaching from higher levels. The prospect does not seem to be of any commercial value. The Branch prospect, farther west, at the north edge of the bottom of Branch Canyon, is on a brecciated fault zone that dips 75° SE. It is opened by a 50-foot tunnel and contains more quartz than some of the other prospects in this canyon.

The Hercules prospect, in the northern part of the district, is owned by the Hercules Mining Co. It is said to be on a fault-breccia zone, a mile in length, and to have considerable mining machinery on the ground about ready for operation.

In the lower half mile or more of Branch Canyon are gold placers about 100 feet in thickness, and as the gravel is very angular and porous and the gold is very fine, the gold is concentrated almost entirely on or near bedrock, where the gravel is said to run from $2 to $3 in gold to the cubic yard. Several attempts have been made to recover the gold by the dry-washing process with machinery and otherwise, but the results were not successful. The deposits can probably be mined best by the room and pillar method.

The outlook for the Gold Basin district is not encouraging. The deposits on the whole are small and of low grade. Few, if any of them, can be profitably mined, even on a small scale, in the oxidized zone, much less in the sulphide zone below the levels of enrichment, where they are doubtless very much leaner. This statement seems to apply equally well to the remainder of the large rectangular area of volcanic rocks extending from the Fairview Mountains 5 miles eastward and from Bell Flat 10 miles northward, nearly to Westgate and the Lincoln Highway, of which the Gold Basin district is only a one-eighth part.

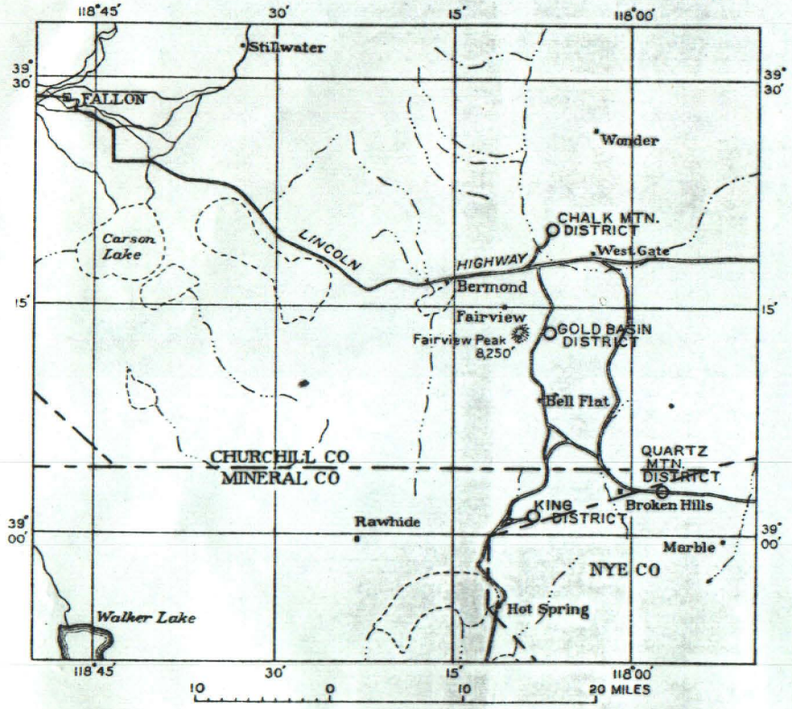
King District (196)

The King district is in the northeast corner of Mineral County, 50 miles southeast of Fallon, 15 miles west-southwest of Quartz Mountain, about midway between Quartz Mountain and Rawhide, and just west of Mount Anna, a prominent landmark. (See fig. 2.) The region is underlain principally by tilted Tertiary volcanic rocks which rest on Mesozoic(?) limestone, diorite, and granite. Gold is said to be widely distributed in andesite and rhyolite for the extent of nearly a mile.

Here, in September, 1926, a stringer or small vein of rich gold ore was found by B. H. Donelly and Tex. Mondell at a depth of about 10 feet in an old shaft sunk in diorite porphyry. The strike soon attracted attention, and by October 20 a hundred men were camped on the ground. Soon after the discovery was made the principal properties, including the King and Queen claims, were taken over by the Desert Queen Mining Co. By November 10 two more strikes of high-grade silver-lead ore were made in parallel veins on the Queen claim. The ore is said to be associated with rhyolite, which intrudes the diorite. Some of it is said to run about 50 per cent of lead and 250 ounces in silver and $2 in gold to the ton. By January, 1927, development showed the gold vein to carry 6 feet of ore on the 50-foot level, in April the Queen claim was reported to show 17 feet of mill-grade ore on the 100-foot level, and by June there had been shipped from the gold vein, it is said, 35 tons of $40 gold ore.

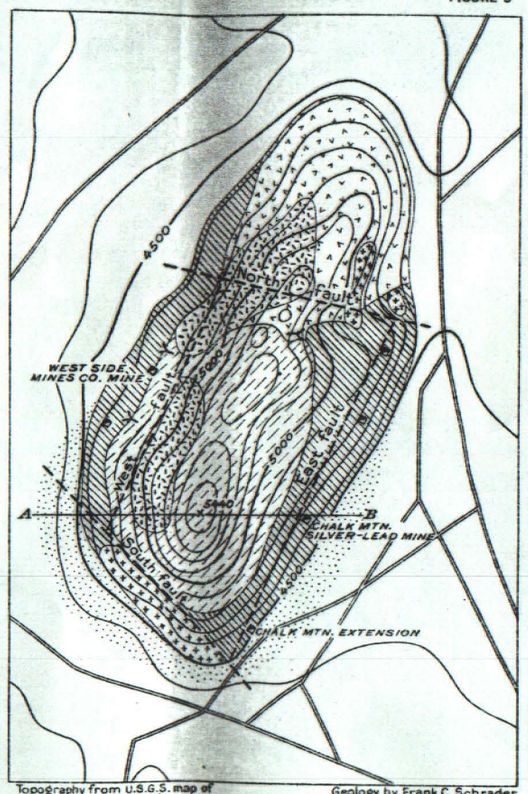
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

FIGURE 2



OUTLINE MAP SHOWING LOCATION OF CHALK MOUNTAIN AND QUARTZ MOUNTAIN MINING DISTRICTS, NEVADA

FIGURE 3



EXPLANATION

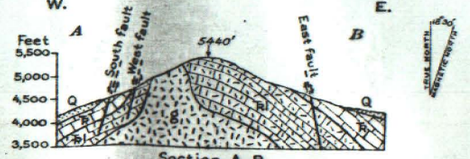
SEDIMENTARY ROCKS

- Alluvium (wash) — Quaternary
- Limestone — Triassic(?)
- Limestone (Marmerized) — Triassic(?)

IGNEOUS ROCKS

- Rhyolite — Tertiary
- Andesite — Tertiary
- Granodiorite — Cretaceous or Jurassic

Shaft
Tunnel



GEOLOGIC SKETCH MAP AND SECTION OF CHALK MOUNTAIN, CHURCHILL COUNTY, NEVADA

0 ½ 1 Mile
Contour interval 100 feet

FIGURE 4

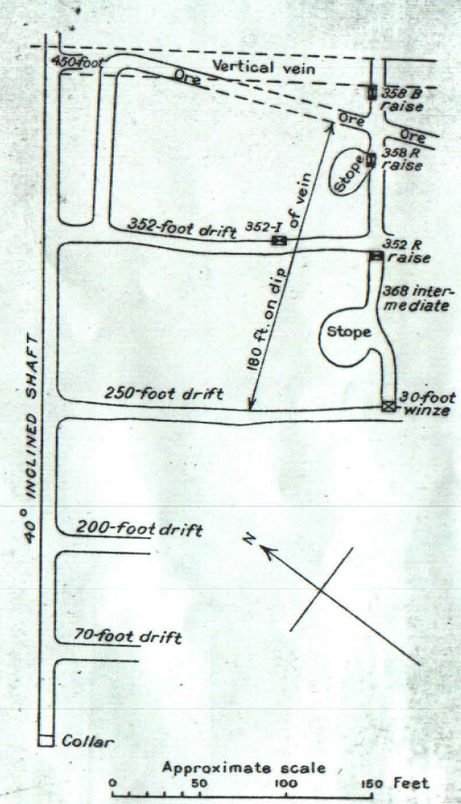


DIAGRAM OF THE PRINCIPAL WORKINGS ON THE LEASE VEIN IN THE SAN RAFAEL MINE, QUARTZ MOUNTAIN, NEVADA