CHERRY CREEK (EGAN CANYON) DISTRICT*

By F. C. SCHRADER

White Pine County

INTRODUCTION

The present report is based mainly on a brief visit made to the Cherry Creek District in August, 1930. The writer desires to acknowledge the aid and valuable information obtained from several mining engineering reports, which were kindly furnished by mining men of the district, especially members of the New Nevada Standard Mining Co.

The district has been described by Emmons,[1] Spurr,[2] Hill[3] and Lincoln,[4] on whose reports the present sketch down to the year 1923 is largely based.

LOCATION

The Cherry Creek District is in the Egan Range, four miles west of the Northern Nevada Railroad, with which it has mail-stage connections. (See Figure 1.) It is 90 miles south of Cobre, on the Southern Pacific Railroad, 70 miles south of Shafter, on the Western Pacific Railroad, and 50 miles north of Ely, the seat of White Pine County. Cherry Creek, in the early days a populous town, now has only about 40 inhabitants but is still the distributing point to much of the surrounding mining country.

TOPOGRAPHY

The Egan Range in the Cherry Creek District is a high, narrow ridge that separates Steptoe Valley on the east from Butte Valley on the west. The town of Cherry Creek is at an altitude of about 6,000 feet. It is situated at the mouth of Cherry Canyon at the upper edge of a long, gentle slope that rises about 600 feet in the four miles west from the railroad station. North and west of the town the mountains rise by steep slopes and cliffs

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[1]Emmons, S. F., Egan Canyon District: U. S. Geol. Expl. 40th Par. Rept., vol. 3, pp. 445–449, 1870.

[2]Spurr, J. E., Descriptive Geology of Nevada South of the Fortieth Parallel and Adjacent Portions of California: U. S. Geol. Survey Bull. 208, pp. 47–52, 1903.

[3]Hill, J. M., Notes on Some Mining Districts in Eastern Nevada: U. S. Geol. Survey Bull. 648, pp. 161–172, 1916.

[4]Lincoln, F. C., Mining Districts and Mineral Resources of Nevada, pp. 242–244, Reno, 1923. (Contains full bibliography.)

to an altitude of more than 8,000 feet in less than three miles. From Cherry Canyon for five miles southward to Egan Canyon, which is a narrow notch cut through the range, the topography is less rugged.

GEOLOGY

SEDIMENTARY ROCKS

The rocks of the district consist of sediments of supposed

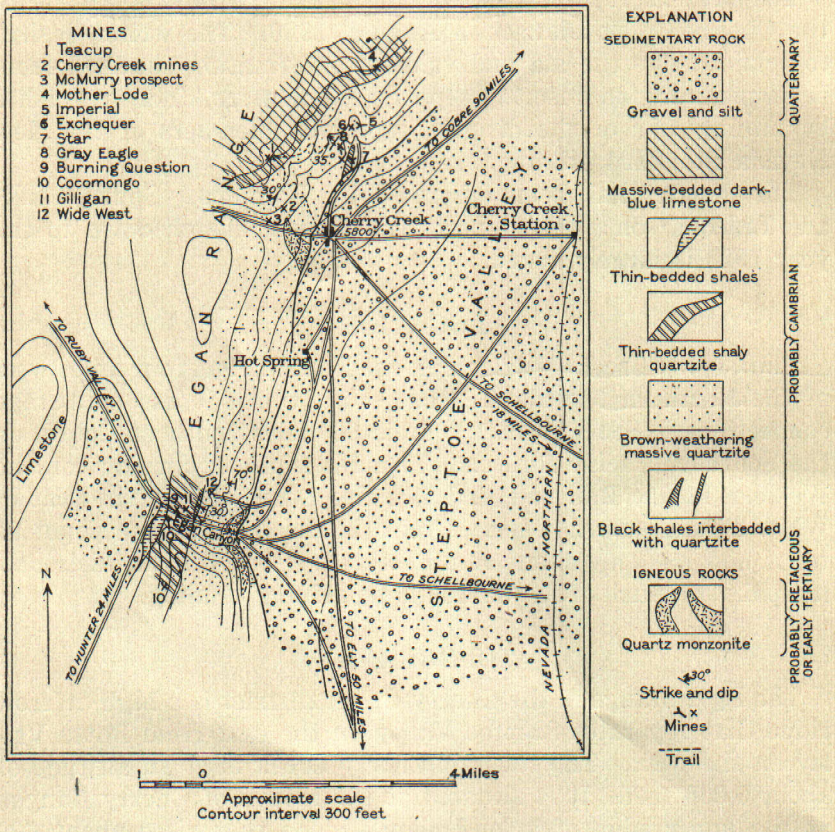

FIGURE 1

Sketch Map of the Cherry Creek (Egan Canyon) District, White Pine County, Nevada. (Hill, U. S. G. S. Bull. No. 648.)

Cambrian age. Their distribution and sequence are shown in Figure 1.

In the east slope of the range the rocks in general dip west-northwest at angles of about 40°, but in the west slope they dip east, according to Spurr, who regards the range as having been carved from a shallow syncline. Accordingly, in the east slope the older rocks are exposed along the base of the range. Here

they are chiefly thick-bedded brownish quartzites, with some interbedded dark arenaceous, micaceous, and argillaceous shales; near the top of the series the quartzite becomes thin bedded and nearly white. The quartzites and shaly quartzites are at least 3,000 feet thick and are thought to be the equivalent of the Cambrian Prospect Mountain quartzite of the Eureka section.[5] They are overlain by blue-gray limestone and intruded by small dikes and masses of quartz monzonite and diabase. Hill[6] suggests that the limestone and the dark shale near its base, which overlies the quartzite northwest of Cherry Creek are probably to be correlated with the Cambrian Eldorado limestone of the Eureka section.

At the Star mine, just below the assay office and mill, in the lowest part of the section exposed, there is a bed of hard siliceous conglomerate about 50 feet thick, composed mainly of white quartz and dark slate pebbles averaging less than half an inch in diameter. The persistence of this bed is not known, but the horizon of the exposure suggests that it may mark an unconformity.

IGNEOUS ROCKS

The only igneous rocks found in the district are quartz monzonite and diabase, which are intrusive into the older sediments.

Quartz Monzonite

Quartz monzonite porphyry occurs as small masses and dikes within a north-south belt about six miles long and more than a mile wide. The most prominent masses are at the mouth of Egan Canyon and at the Cherry mines in Cherry Canyon; the principal dikes are west of the Star mine. In the Star mine a persistent dike was noted in the west drifts on the sixth and seventh levels and on the tunnel level at the end of the Star vein in the Walker drift. It also occurs in the Imperial and Exchequer mines.

The rock that forms small masses, as typically seen in the Mary Ann mine of the Cherry Creek group, where it is associated with the veins, is gray, medium grained, granitoid, and porphyritic with pink orthoclase phenocrysts as much as half an inch in length. It is composed of orthoclase and oligoclase-andesine in about equal amounts, quartz, greenish-brown biotite, and a little hornblende, with apatite, magnetite, and titanite as accessories. The rock that forms dikes, however, is finer grained

[5]Hague, Arnold, Geology of the Eureka District, Nevada: U. S. Geol. Survey Mon. 20, pp. 34–36, 1892.
[6]Hill, J. M., op. cit., p. 163.

and more basic where fresh, but in the mines it is in general highly altered, the feldspars being changed chiefly to sericite and the biotite to chlorite and iron oxide. Gradations showing the close relation of these different varieties are observable in thin sections studied under the microscope. Probably most of the ore deposits are genetically connected with the quartz monzonite, which is mapped by Hill as of probable Cretaceous or early Tertiary age.

The dike associated with the Exchequer vein in the Imperial mine is a dull-gray fine-grained rather dense rock, which contains little or no visible quartz and corresponds closely to monzonite. In the neighboring Exchequer mine the dike along the same vein is a darker-gray medium-grained quartz monzonite porphyry and has a microgranitic structure. It is distinctly siliceous and is speckled with feldspar phenocrysts 0.2 inch or less in diameter. It contains more ferromagnesian minerals than the dike in the Imperial mine.

In the Walker drift of the Star mine the rock is greenish gray and appears to be intermediate between the two varieties just described, but the microscope shows it to be an altered quartz monzonite porphyry. It contains finely disseminated pyrite and shows a parallel arrangement of the minerals that in places resembles flow structure. Much chlorite derived from biotite gives it the greenish tinge.

Diabase

The diabase is nearly black, with fine-grained ophitic or diabase texture. It occurs as a dike on the tunnel level of the Star mine and probably also on the deeper levels, for fragments are found on the Star shaft dump. It is composed chiefly of basic plagioclase, augite and biotite. The rock on the Star dump has been hydrothermally altered. It is sparingly pyritic and contains much magnetite, much green hornblende, derived from augite, and chlorite and iron oxide derived from biotite. The rock is believed not to be genetically connected with the ore deposits, though it seems to be older than the veins in the Star mine.

ORE DEPOSITS

HISTORY AND PRODUCTION

Ore was first discovered in the district in 1861 in Egan Canyon, on the Gilligan vein, and, by 1866, $60,000 worth of ore had been produced there. Estimates of production prior to 1902 range from $6,000,000 to $20,000,000.

The production for which figures are available, based chiefly

on reports by V. C. Heikes in "Mineral Resources of the United States," is as follows:

Period	Ore (tons)	Gold (ounces)	Silver (ounces)	Copper (pounds)	Lead (pounds)	Total value
1902–1904	.....	6,201.57	52,975	.....	.....	$152,735
1905–1922	23,758	*$246,154	334,720	96,053	645,788	566,670

*Value.

Mining in the district was most active from 1872 to 1883, and during that period the population of Cherry Creek is said to have reached 6,000. But decline followed, and production practically ceased in 1893, with the demonetization of silver. Later, however, the camp revived, and since 1895 work has been done at several properties, notably the Star, Exchequer and Teacup mines, which have been worked more or less steadily on a small scale down to the present time.

In 1905 to 1908 the Teacup mine was active and shipped ore. Up to about 1906 the Exchequer, which by some is credited with an early production of $3,000,000, is known to have produced $2,500,000 while it was worked by the Jones-Hand-Prior Co. In 1906 to 1910 the Star mine produced ore and later kept the water pumped out until 1913, when it, together with the Nevada-British, Chief of the Hills, and Mascot was acquired by the Nevada Standard Co. From 1917 until the drop in silver in 1923 the Mary Ann mine, a member of the Cherry Creek group then being worked by the Cherry Creek Silver Dividend Mining Co., produced $35,000 worth of silver ore, which contained also about $1 in gold to the ton. Prior to 1893 this mine is reported to have produced $65,000. The mine is opened chiefly by an upper and a lower tunnel, each 1,000 feet long. The veins and ore dip east in limestone and quartz monzonite.

In 1920 to 1923 the Exchequer mine, reopened by the Silver Dividend Mining Co., of Pioche, produced 5,350 tons of silver ore that ran $16 to the ton, a total value of $85,600. Since 1924, when the Star mine was taken over by the Nevada Standard Mining Co., it and the Exchequer have been worked on a moderate scale and the Star has produced about $27,000. The North Mountain mine, in Egan Canyon, was worked in the fall of 1929 and produced several hundred tons of ore.

TYPES OF DEPOSITS AS DESCRIBED BY HILL[7]

"There are two somewhat overlapping types of veins in the Cherry Creek (Egan Canyon) District. One type, represented by the Wide West, Cocomongo, and possibly the McMurry prospect, has its principal value in gold carried in a white quartz gangue

[7]Hill, J. M., op. cit., p. 165.

that shows a minor amount of pyrite and less galena. The other and by far the most important in the district is represented by the Exchequer, Star, Biscuit, Cherry Creek, and Gilligan veins, which carry galena, sphalerite, pyrite, and rich secondary silver minerals. That there may be a transition between these two types is strongly suggested by the Exchequer New Century (Imperial) vein, in Exchequer Canyon, north of Cherry Creek. West of the canyon, on the Exchequer ground, the quartz carries the base-metal sulphides and contains more silver than gold; and east of the canyon, on the New Century (Imperial) ground, what appears to be the same vein is not strongly mineralized but carries pyrite, gold, and silver. It may be that the gold- and silver-bearing portions of the veins are those parts which have not been strongly mineralized and that the ore shoots will all prove to be of the lead-zinc type, carrying more silver than gold. In both types the veins are strong in the quartzites but tend to finger out where the fissure enters argillaceous shales. This is particularly well shown on the Gilligan and Star veins.

"At the upper tunnel on the Cherry Creek Co.'s property the ore body is a mineralized quartz monzonite dike carrying galena, sphalerite, and pyrite. It is evident that the dike was metallized after its consolidation, and it is believed that most of the veins of the district were formed shortly after the intrusion of the quartz monzonite.

"The lead-zinc veins have been crushed since the deposition of the original ores and have been enriched by descending waters which have deposited rich silver minerals such as argentite, proustite, and an antimonial silver-lead-copper mineral of uncertain composition. The enrichment of the Star vein, as indicated by the largest stopes, was greatest between the third and seventh levels but extended to a depth of 600 feet vertically below the croppings. At the Biscuit mine argentite and copper carbonates are said to have been found to a depth of 1,100 feet on the dip of the vein."

In nearly all the mines oxidation extends to depths of 200 to 300 feet.

MINES AND PROSPECTS

Only a few of the mines were accessible at the time of visit. Their general distribution is shown in Figure 1.

STAR GROUP OF MINES

The Star group of mines is about two miles north of Cherry Creek, in the east slope of the range. (See Figures 1 and 2.)

It comprises the mines or properties and claim groups formerly known as the Star, Gray Eagle, Exchequer, Imperial, and Nevada British, aggregating about 500 acres, which were consolidated under one ownership in 1929.

STAR MINE

History and Production

The Star mine is about one and one-half miles north of Cherry Creek in the southern part of the Star group at an altitude of about 6,700 feet. (See Figure 1.) It was worked chiefly in 1872 to 1883 and has produced more than $6,000,000. After striking a heavy flow of water at the depth of 350 feet in 1880, the Star crosscut tunnel was started for drainage, and a little later mining was resumed and continued until the decline in the price of silver in 1893. Up to that time the mine had produced $5,000,000 in gold-silver bullion, in which gold was the predominant metal by value.

The Glasgow & Western Exploration Co. worked the mine between 1895 and 1910 and advanced the Star tunnel to a point 800 feet beyond the shaft, but the vein disappeared about 400 feet west of the shaft, and as crosscutting to the north failed to find it, it was supposed to have pinched out. An adequate water supply, however, was obtained from the tunnel, and before operations ceased in 1910 three unsuccessful attempts were made to mill the ore locally. The mine was kept pumped out, and in 1913 the Nevada Star Mining Co. began operations. As this company was operated with British capital, the outbreak of the World War forced a withdrawal of financial support, and the mine was again closed in 1914.

The mine was later worked by lessees until 1924, when it was taken over by the Nevada Standard Mining Corporation, under whose operation, directed by J. W. Walker, it has produced about $27,000, more than half of which was in gold.

In 1927 Mr. Walker recovered the Star vein by crosscutting to the south on the tunnel level, and in 1927–1929 he drove the Walker drift 800 feet westward on the vein. During the fall of 1929, until the stock-market crash, the mine and mill employed more than 100 men, and 35 men were kept at work until the midsummer of 1930.

At the time of visit in August, 1930, the Star mine was being worked with a force of 20 men under a cooperative leasing system that was said to be very successful and to yield about $60 net a day. The company was also milling ore from the old Star

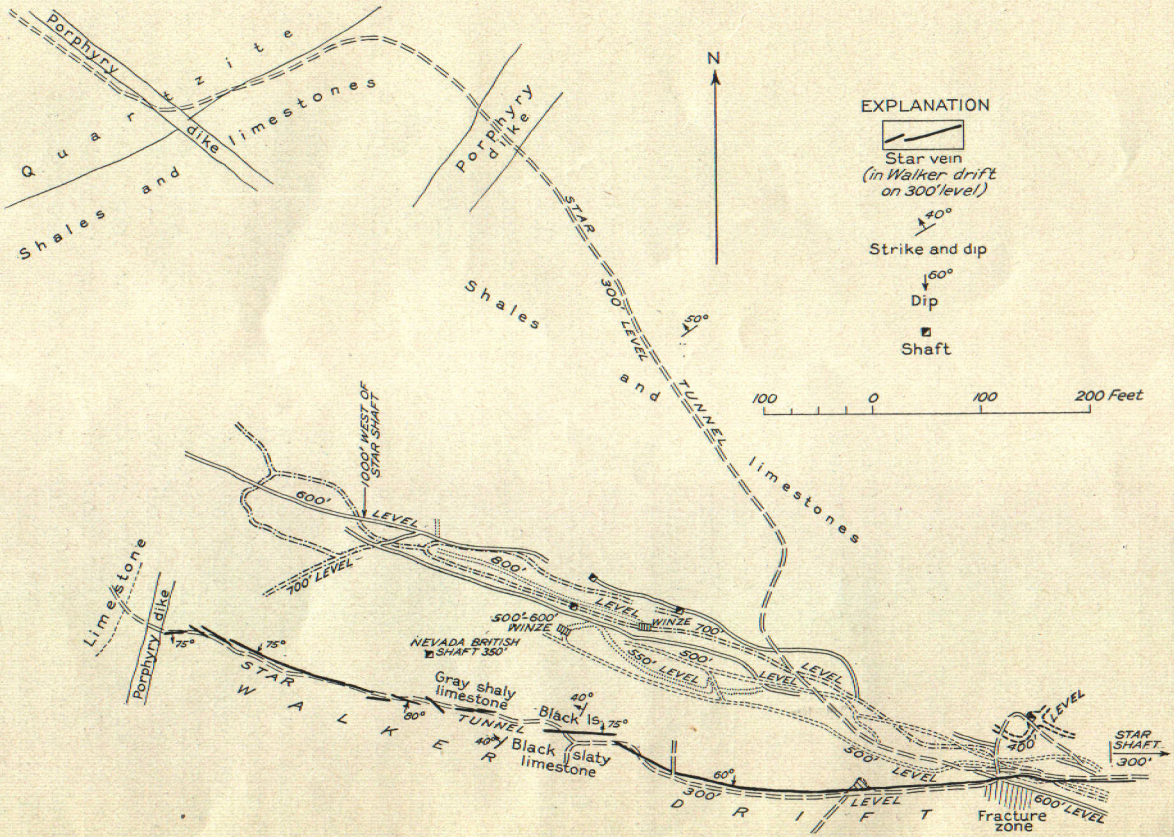

FIGURE 3—Map Showing Part of Workings in Star Mine of the New Nevada Standard Mining Co., Cherry Creek, Nevada. (Diagrammatic.)

shaft dumps which were estimated to contain 10,000 tons, with a tenor of about $6 to the ton in gold and silver, about equal in value, 7 per cent of lead, and 3 per cent of zinc. The concentrates produced contained 288 ounces of silver to the ton, considerable lead, and a small amount of gold, and were hauled by truck to one of the smelters near Salt Lake City. The extraction obtained in the mill was about 92 per cent. The company produced its own electric power and light. The miner's wage was about $5.50 a day and that of the engineer $6.

In March, 1931, the company was treating chiefly ore from these dumps in its flotation mill. The funds thus obtained were being used to drive the new Lower Star drainage tunnel, which was to have a total length of 2,000 feet and had then attained a length of 500 feet.[8]

Development and Equipment

The mine is developed by a three compartment vertical shaft 750 feet deep, with nine levels aggregating more than 15,000 feet of work. (See Figures 2 and 3.) Underground work is conducted through the Star tunnel, or third level, which drains the upper part of the mine. The tunnel, advanced from the 2,000-foot point since 1913, is now 4,200 feet long and intersects the shaft 1,400 feet from the portal at a depth of 340 feet. The lower levels (Figure 3) were under water at the time of the visit, and the old workings above the tunnel level were mostly caved and mined out.

A 20-stamp mill and cyanide plant has recently been remodeled to treat the ore by flotation, and the stamps have been replaced by a ball mill. The plant includes also a small ball mill, a tube mill, a 250-horsepower gasoline engine, an 8-horsepower Diesel engine burning 27° gravity oil, and an emergency Koler-Koler generator.

The Star tunnel discharges 15 cubic feet of potable water a minute, more than enough to supply the camp and a 100-ton mill, and this quantity will probably be considerably increased when the projected Star workings cut the water-bearing strata of the Exchequer mine. If much ore is found in depth in the Exchequer and Imperial mines below the Star tunnel level the company contemplates extending the lower tunnel, which will drain all the mines to a much lower level.

Deposits

The ore occurs in two nearly parallel quartz veins about 30 feet apart which cut across quartzite and shale. They are

[8]Nevada Min. Press, vol. 13, p. 1, 1931.

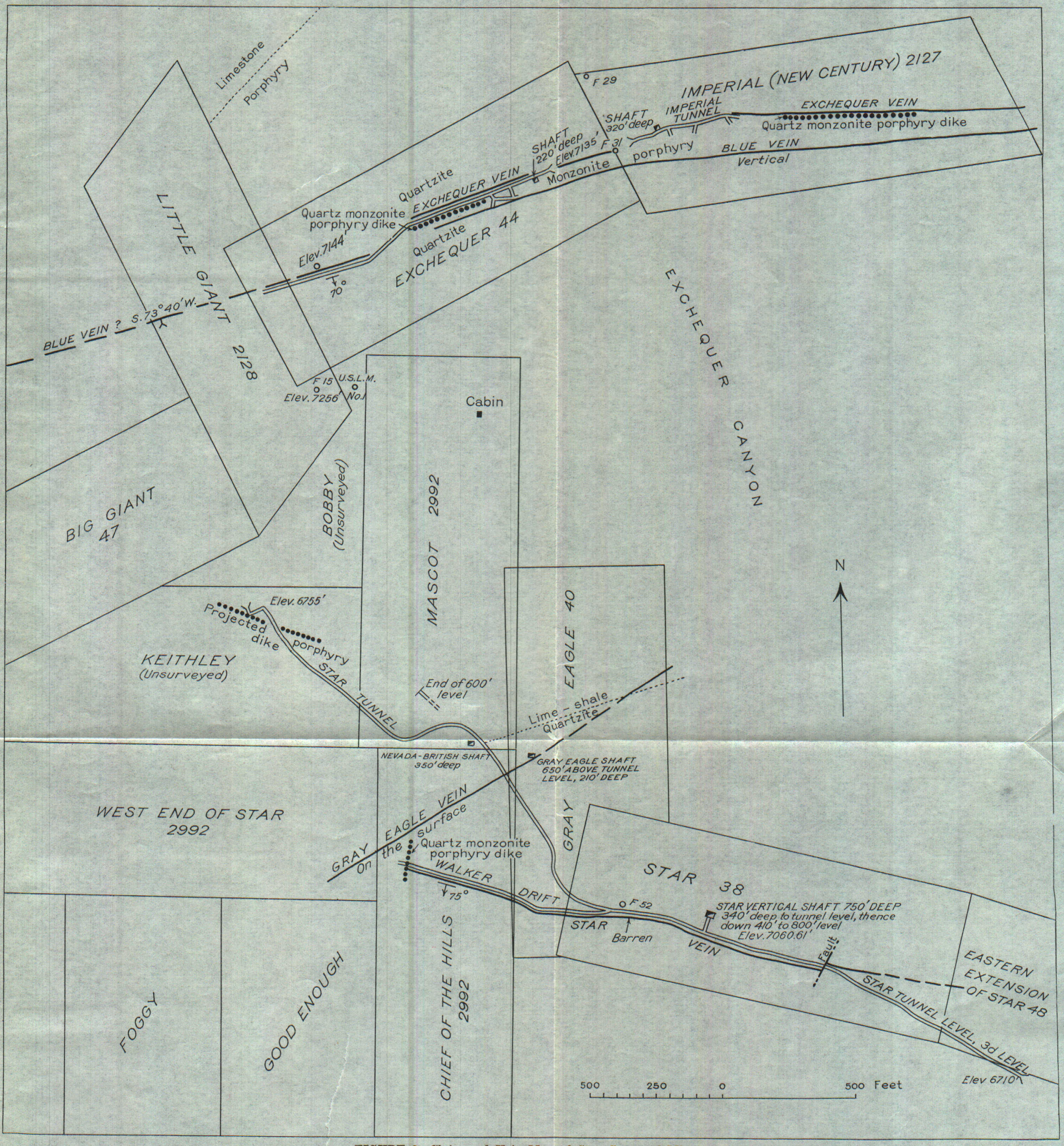

FIGURE 2—Claim and Vein Map of Star Group of Mines.

known as the Star or South vein and the North vein. They are best developed in the quartzite and finger out and become barren in the shale. In a few places they are associated with dikes of the quartz monzonite. The Star vein ends at a quartz monzonite dike near the face of the Walker drift on the Star tunnel level, and both veins are said to cut the same dike near the west ends of the sixth and seventh levels.

The veins have a known horizontal extent of about 2,200 feet and a vertical range of about 900 feet, with good indications in the deepest workings of continuing to greater depths. The winze extending from the seventh to the ninth level, the bottom of the mine, is said to be on the vein and mostly in good ore. In this horizontal extent, however, the deposits include a barren zone extending 250 feet westward from a point a little beyond the shaft. The Star or South vein strikes N. 72° W. and the North vein N. 78° W. Both dip steeply south for the most part, but in places they stand vertical or dip steeply north. Their intersection on the sixth and seventh levels is about 1,000 feet west of the shaft. They have well-defined walls, but little or no gouge. The Star vein is the larger and more productive. It ranges from 1½ to 7 feet in thickness, with an average of 2 feet; one ore shoot mined had a maximum horizontal extent of 1,000 feet and ranged from 1 to 6 feet in thickness, averaging 2½ feet. The North vein, which is about 1 foot wide on the average, has received comparatively little attention.

The veins in places are associated with quartz monzonite and are cut by small vertical normal faults that strike north-northeast, about parallel with the strike of the country rock. The part of the vein west of the fault is generally displaced to the south, as in the Star tunnel east of the shaft. (See Figure 2.)

In the Walker drift the vein ranges from 1.2 to 3 feet in width and carries good ore through almost the entire extent of the drift, near the end of which it ends against a quartz monzonite dike.

In the upper levels the ores are highly siliceous and oxidized, but they become base in depth, where the ore minerals consist mainly of galena, sphalerite, and pyrite in a roughly banded white quartz gangue. These sulphides, however, have been in part replaced by tetrahedrite, proustite, stephanite, pyrargyrite, polybasite, argentite, and chalcopyrite, largely as pseudomorphs after the primary minerals, especially galena and sphalerite. These secondary minerals occur also as veinlets filling fractures in the vein and in the wall rock. Enrichment has extended even

to the eighth and ninth levels, although here the ore is base, carrying about 8 per cent of lead and an equal amount of zinc.[9] Ruby silver and tetrahedrite are present in the richest ore, and silver chloride and bromide were also noted in the oxidized ore.

The ore of the Star mine is said to average about a quarter of an ounce in gold and 20 ounces in silver to the ton, and about 8 per cent each in lead and zinc. It is not amenable to cyanidation. Some of the ore, however, is very rich in both gold and silver and is said to run as high as 800 ounces in silver to the ton. Yellowish-brown scheelite was noted in one specimen. A specimen of the rich gold-silver ore collected by the writer from the vein near the face of the Walker drift consists of vein quartz crudely banded with galena, sphalerite, pyrite, and ruby silver. The gold in the ore is mostly associated with the pyrite and sphalerite. Tetrahedrite, which is rich in silver, is also associated with the sphalerite.

A polished section of the rich ore from the Star tunnel level shows the metallic minerals in order of relative abundance to be pyrite, sphalerite, and galena. The sphalerite contains tiny elongated blebs of chalcopyrite showing a tendency toward parallel orientation. The rough sides of the specimen show wire silver, which has formed along minute seams in the quartz in sufficient quantity, it is believed, to account for most of the silver present. The wire silver is probably of hypogene origin.

A thin section of this ore shows a considerable quantity of a dark silver mineral which may be argentite and also contains small specks of what is probably gold associated with calcite.

According to Hall, who examined the mine in 1928, the reserves at that time amounted to 34,450 tons of ore but this figure did not include the ore in the vein above the Walker drift, which was a later discovery. As the vein carries ore throughout the length of the Walker drift, which is 800 feet long and 650 feet below the surface, it is regarded as containing a large volume of possible stoping ground between the drift and the surface.

Other engineers credit the Star mine with a proved reserve of 15,222 tons of ore containing about 30 ounces of silver to the ton and a possible additional reserve equivalent to 4,000,000 ounces of silver.

GRAY EAGLE VEIN

The Gray Eagle shaft lies about 900 feet northwest of the Star vertical shaft. It is 210 feet deep, and the collar is at

[9]Hall, Clarence, unpublished report on the properties of the Nevada Standard Mining Corporation, 1928.

an altitude of about 7,400 feet, or 650 feet above the Star tunnel level, through which the vein will be worked. (See Figure 2.) The vein strikes N. 60° E. and dips 45° NNW., cutting shale, limestone, and quartzite. It is about 3 feet in width and has a known length of about 1,600 feet. It crosses the Gray Eagle and Chief of the Hills claims. On the latter it has been called the Mascot vein and is said to crop out at a height of 1,175 feet above the Star tunnel level. The ore is said to run about 0.3 ounces of gold and 8 ounces of silver to the ton.

EXCHEQUER AND IMPERIAL MINES

The Exchequer and Imperial (New Century) mines, on the west and east side of Exchequer Canyon, constitute the northern part of the Star group (Figure 2) and are about 3,800 feet north-northwest of the Star mine, at an altitude of about 7,100 feet or 400 feet higher than the Star tunnel, by which they will eventually be drained. They were among the first mines to be worked in the district. They are on two approximately parallel veins, about 60 feet apart, the Exchequer or North vein and the Blue vein, which strike about N. 80° E., stand about vertical, and have a length of about 3,000 feet on the property but are said to be known from outcrops to have a total extent of more than 4,000 feet.

The veins lie in the series of argillite, limestone, shale, and quartzite, which here has been much disturbed, and are associated with one or more dikes of the quartz monzonite porphyry. The ore is reported to run 22 ounces of silver and 0.05 ounce of gold to the ton, and much of the quartzite and quartz monzonite porphyry between the two veins is supposed to be sufficiently mineralized to form ore of milling grade.[10]

IMPERIAL MINE

The Imperial mine is opened by an adit 600 feet in length and a 320-foot shaft. The adit is driven westward on the Exchequer vein and intersects the shaft about 70 feet below the surface. At the time of visit the shaft was accessible only to the 150-foot level. The vein here consists mainly of a mineralized quartzite breccia in a fault zone about 11 feet wide and is associated with a fine-grained quartz monzonite dike which forms a considerable portion of its south wall and extends southward to the Blue vein. The ore-bearing portion of the vein, however, is from 2 to 6 feet wide and averages about 4 feet.

[10]Hand, C. T., unpublished report on the Exchequer and Imperial mines, September 27, 1919.

There is said to be ore in the bottom of the shaft, but no large body of sulphide ore has been found. According to Prior,[11] the strongest showing is on the 250-foot level, where the ore shoot for a length of 110 feet averages 6 feet in width.

The ore minerals are pyrite, galena, tetrahedrite(?), cerargyrite, stromeyerite, and argentite(?). A considerable portion of the ore is said to run about 30 ounces in silver and $1 or more in gold to the ton.

The ores are not as complex as those of the Star mine and can be cyanided. Cerargyrite, said to have been abundant in the surface ores first mined, was not seen in the present workings, although the ore now exposed is more or less oxidized.

The minerals are finely disseminated in the gangue and in part follow fractures and seams, along which they form irregular replacement bodies extending laterally into the quartzite and quartz.

The principal ore mineral occurring along fracture planes in the quartz is a black mineral which a polished section of the ore shows to be stromeyerite $(Cu,Ag)_2S$. In places this is partly oxidized to malachite and black copper oxide (melaconite). Limonite is also present in places. All these minerals are regarded as of supergene origin.

According to reports by several engineers the total proved and possible reserves of the mine amount to 132,125 tons of ore with a tenor of 25 to 35 ounces of silver to the ton.

EXCHEQUER MINE

The Exchequer mine, on the west side of the canyon, is opened by a 1,200-foot tunnel and a 220-foot shaft, mainly on the Exchequer vein, which has produced more than $3,000,000 in silver, much of it from ore of shipping grade.

For the first 600 feet of the drift westward from the portal the Exchequer vein is separated from the Blue vein by a 30-foot dike of quartz monzonite porphyry. Throughout this part of the mine the vein is 12 feet thick and contained an average width of 10 feet of low-grade ore, which occurred in shoots 2 to 8 feet thick that raked steeply north. There was also high-grade ore in streaks, mainly in a zone 4 feet wide along each wall.

The oxidized ore is very siliceous and resembles that in the Imperial mine. A considerable shipment made by J. W. Walker ran 92 per cent silica.

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[11]Prior, C. E., unpublished report on Exchequer and Imperial mines.

The average of ore reserves with which several engineers credit the Exchequer mine is as follows:

Proved—31,000 tons of ore containing about 30 ounces of silver to the ton.

Partly proved—34,000 tons of ore containing about 25 ounces of silver to the ton.

In 1919 it was estimated that the ore of the Exchequer and Imperial could be mined and milled at a cost of about $6.50 a ton.

BLUE VEIN

Although the Blue vein has been but little developed, it is said to be nearly as promising as the Exchequer vein. Much of it for a width of 8 to 11 feet is said to average 16 ounces in silver and 80 cents in gold to the ton.

TEACUP MINE

The Teacup (Biscuit) mine (No. 1, Figure 1) is 2½ miles northwest of Cherry Creek, near the top of the range, at an altitude of about 7,800 feet. It is probably on the continuation of the Mother Lode zone, described below. It was worked in the early days and also in 1907 and 1912 and is said to have produced about $3,000,000 in silver. It is developed to a depth of 1,100 feet through a shaft that inclines westward at an angle of about 40° and has many short levels and drifts. The deposit follows a tabular sheet of fault gouge beneath a 25-foot bed of greenish shale interbedded with limestone. The ore occurs in lenticular bodies of white quartz which have replaced the footwall limestone beneath the gouge. According to Hill, the valuable ore mineral is either argentite or stromeyerite. Copper carbonate stains fracture faces in the ore. A width of 9 feet of good-grade mill ore is reported to be exposed in the bottom of the shaft.

A specimen of dark-gray to blackish ore collected from the dump consists chiefly of replacement quartz of two or more stages of deposition, with veinlets filling fractures. It weathers brown, owing to its iron and manganese content, and is more or less calcareous. Most of its dark mineral content seems to be manganese oxide.

MOTHER LODE

The so-called "Mother Lode," known also as the Upper or Teacup lode, is an extensive mineralized zone near the top of the mountain and relatively inaccessible. It follows the "final" contact between the quartzite-shale series on the east and the

overlying blue massive limestone on the west. For the most part it has a limestone footwall and green shale hanging wall, but in a few places two or three feet of limestone occurs on the hanging-wall side. It is said to average about 20 feet in width and to be traceable from a point south of the Teacup mine 12 miles north-northeastward, to the foot of the mountain, where it passes beneath the detritus of Steptoe Valley. Its outcrop is said to be almost continuous throughout this distance. The lode is geologically and mineralogically very similar to that of the Teacup mine, which seems to be a part of it. Like the Teacup lode, it dips westward at medium angles.

The lode is not known to have made much production other than the $3,000,000 in silver produced by the Teacup mine. In 1919 and 1920 J. W. Walker and associates working on a part of it owned by the Mother Lode Co. crosscut the lode by a 2,000-foot tunnel at a vertical depth of 600 feet. The lode here was found to be 16 feet in width, with an average tenor of $10 a ton. Several shipments of selected ore carried 57 ounces of silver to the ton and 10 per cent of lead, with a high content of silica and iron.

About one and a half miles (five claim lengths) on the southern part of the lode, extending from the ridge north of the Exchequer mine northward, is owned by the Mother Lode Mining Co., of Philadelphia, Pa., and is being operated under lease by the Liberty Mining Co., of White Plains, N. Y.

Adjoining the Mother Lode property on the north is the Good Chance lead-silver prospect, a group of three claims seven miles north of Cherry Creek, which is being worked with encouraging results by S. T. Stafford and associates. Beyond the Good Chance property some of the remaining six miles of the lode has not been staked, and much of the lode as a whole has been but little prospected.

NEVADA STATE BUREAU OF MINES AND MACKAY SCHOOL OF MINES PUBLICATIONS

Mining Districts and Mineral Resources of Nevada, 1923 ..... $1.50

The Identification of Nevada's Common Minerals, 1928—

Without chart ..... .25

With chart ..... .50

Dumortierite, 1928 ..... Gratis

Mineral Resources of Southern Nevada, 1929 ..... Gratis

The Underground Geology of the Western Part of the Tonopah Mining District, Nevada, 1930 ..... Gratis

A Preliminary Survey of the Scossa Mining District, Pershing County, Nevada, 1931 ..... Gratis

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