

A gold prospect, situated adjacent to the tungsten and occurring in the overlying volcanic rocks, was explored many years ago under the name of Rainbow Canyon Mines.

South of Olinghouse, deposits of diatomite occur along the north side of the Truckee River between Sparks and Wadsworth. Closer to Sparks there is a rhyolitic tuff from which an excellent light-weight building stone has been quarried for use in Sparks and Reno, according to Humphrey (1945).

North of Olinghouse, in the Nixon area, deposits of shells and of limestone occur from which shipments have been made. A small lime kiln was operated for a short time in the early '40's at Nixon, the limestone coming from a deposit of limestone near the railroad loading point of Numana.⁷

PEAVINE (Crystal Peak, Granite Mountain, Reno)

The Peavine mining district is centered around the peak by that name, which is situated 10 miles northwest of Reno. The area generally considered within this district lies parallel to and reaches about eight miles north of the Truckee River, and extends from the California border eastward twelve miles where it is adjoined by the Wedekind district.

Geology. The formations include Mesozoic and probably Paleozoic sediments which have in part been intruded and metamorphosed by Cretaceous quartz monzonite. Gianella (1942) judges these older stratified rocks to belong in the Paleozoic series because of their marked resemblance and similarity to the tuffaceous sediments of the Feather River region. In addition these rocks have suffered a greater degree of metamorphism than the nearby middle Mesozoic sediments which are exposed in a small area on the north shoulder of Peavine Mountain. These older formations are flanked on the east and south by at least three Tertiary andesite flows. The flow rocks are in turn flanked by sediments commonly referred to as "Truckee" formation, which are probably of Pliocene age. They are exposed in the terraced foothills sloping from Peavine to the river. Interbedded with the basalt sediments of this formation are gravels derived from the earlier andesite flows and concurrent tuffs, grading upward into shaly sands and diatomaceous earth with minor beds of impure lignite exposed in the area northeast of Verdi. Curious pieces of slag and rock with a roasted appearance have been found near this outcrop, which indicate to Gianella (1942) that in the past these beds have been ignited.

In both Truckee Meadows and Lemon Valley alluvial sands and

fine silts cover the floor of these depressions to obscure any older formations underlying the valleys.

The stratified rocks on Peavine generally strike N. 60 degrees E., and dip steeply southeast or stand nearly vertical, however, the beds exposed on the northwest slope show rather flat dips. These rocks have a characteristic green-gray to dark gray color, due to the development of epidote and chlorite in most of the members, which nearly all weather to a dull red-brown color.

The intrusive rock has a coarse granular texture with a porphyritic phase exposed in numerous dikes in the schist areas beyond the contact. A massive tongue of quartz monzonite covering most of the west slope extends from a broad base westward to terminate in a triangular apex just east of the summit and about one-half mile west of Poeville, situated in the schist area.

Approximately two and one-half miles eastward from Peavine summit a north trending contact marks the boundary between the schist and the eastern mass of quartz monzonite. Veering from a quarter to one and one-half miles east of this contact the intrusive body is overlain by andesite flows with the exception of a small boss of monzonite exposed near Fulton's quarry.

The oldest of the flow rocks is a hornblende andesite which is not widely exposed. Succeeding this flow is a dark, fine-grained augite andesite, which is widely distributed in the eastern portion of this district and may readily be mistaken for a basalt because of its dark color and vesicular structure. It usually weathers to a rusty brown color except where it has been altered by hot solutions, in which case it may vary from a light green to a bleached white or maybe stained a brilliant red by ferric iron oxides. The younger flow consists of a porphyritic hornblende andesite in which the Fulton quarry was opened about two miles north of Reno. Rock from this quarry can be observed where it was used for the trim on Lincoln Hall and the Old Gymnasium building on the University campus.

Apparently a long period of erosion preceded the extrusion of the first andesite flows, for deep weathering of the monzonite has been observed beneath the andesite contact by Hill (1915). Following, or possibly preceding, this volcanism, faulting began and deformation of the region resulted, as can be observed by the marked scarp on the northeast side of Peavine. This fault has a strike of N. 45 degrees W., which is unusual in this area. It does, however, turn southward along the east slope of Peavine and divide into shear zones which conform to the usual fault pattern. These fault zones can be observed near the highway

just north of Reno where they traverse the highly altered areas of andesite. Other zones of brecciation trend eastward across the low andesite hills to the Wedekind district. These zones can be observed as conglomerate-like masses of bleached and altered rock in which progressive alteration by hot solutions attack the exposed edges of angular brecciated rock to reduce them to well-rounded nodules of andesite in a kaolinized residue. Two types of alteration occur, one, which is confined mainly to the augite andesite, softens and leaches the rock and is accompanied by abundant dissemination of pyrite. The other type is common silicification with some bleaching of the dark minerals so that the resulting product resembles a rhyolite formation.

Mineralization in the eastern portion of Peavine is confined to these altered areas, and Hill (1915) states the greater amount of values are associated with the propylitic or softening type of alteration, in which silver sulphide occurs with minor amounts of galena and sphalerite in a gangue of sericite, calcite, and quartz.

Mineralization in the west portion of Peavine is of two distinct types and of different ages. The earlier copper-gold deposition occurs in the stratified rocks and adjacent intrusives as quartz veins and lenses carrying auriferous pyrite and chalcopyrite. Generally these veins conform to the schistosity of the enclosing formations, as observed at the Red Metals property. The later deposits are replacement zones in the quartz monzonite and resemble the altered areas of andesite previously described in the eastern extension of this district. The Nevada Central deposit exemplifies this mode of mineral occurrence, in which the intrusive rock is altered to sericite, calcite, and quartz containing an abundance of fine-grained pyrite. Traversing this altered zone is a network of innumerable veinlets consisting of about 95 percent pyrite and 5 percent quartz. This type of deposit is cut by the ravine in which the Nevada Industrial placer was found, and Hill (1915) concludes that sufficient gold accompanied this thermal alteration to account for the placer by erosion concentration from the noncommercial veinlets.

Properties. The Black Panther Mining Company was active in 1920 on a group of six copper-bearing claims three and one half miles north of Reno. According to Weed (1920) C. H. Duborg organized the company and was president until succeeded by J. M. Molina. Development of the property is by a 200-foot vertical shaft, in which chalcocite was exposed at a depth of 135 feet. The formation continued in andesite to a depth of 150 feet. The

mineralization is said to exist in a zone between andesite and monzonite, where some 12 percent copper with fair silver values is reported to have been mined on the 165-foot level.

The Molina Mining Company in 1923 continued development work in the mine. In 1925 they reported to Weed that some ore was being mined from the 300-foot level that netted the company \$32 above transportation and treatment charges; however, the organization was dormant by 1931.

The Black Panther Extension, organized in February 1920, consisted of five unpatented claims situated three and one half miles north of Reno and claimed to be the extension of the Black Panther vein. This company, headed by Col. Carson, was reported dormant by Weed in 1927.

Copperfield Mining Company, successor to Nixon-Nevada Copper Corporation (1928) controls 1,400 acres of mineral land near Copperfield on the Western Pacific Railroad. The ground consists of 72 claims, forty of them patented. Mines Register (1937) reports the property was developed by a 40-foot and a 300-foot shaft together with a 460-foot adit in which are exposed four veins.

The Emma was an old property situated on the divide between Lemon Valley and Reno and approximately five miles north of the latter. The mineralization is associated with east-striking veins in quartz monzonite. The abandoned shaft is reported to have been 300 feet deep. The ore is said to have carried gold and silver values associated with pyrite in a siliceous gangue.

The Fravel-Paymaster mine, situated at Poeville, is approximately six miles northwest of Reno. The gold-silver-copper mineralization occurred in veins enclosed by schist and intrusive quartz monzonite dikes. The claims adjoin the Standard Metals property and the development work includes a 400-foot shaft and 2,000 feet of lateral workings, according to Weed (1922).

The Gold Bond mining claims are situated about 10 miles northwest of Reno, on a copper fissure vein in meta-andesite. Mineral Resources reports several small copper-silver ore shipments from the Gold Bond from 1923 to 1930, and the several lots of this ore were treated by the Mason Valley Smelter. It was reported that this property was operated in conjunction with the Golden Fleece early in 1944, but the workings are not accessible according to current United States Bureau of Mines data.

The Golden Fleece mine, an early day producer, is situated on the northeast slope of Peavine Mountain, and about 10 miles northwest of Reno. It was considered by Whitehill (1875) as

the chief location in the district, but its ores were considered at that time very base. The claims are located on the Poe ledge system. Large sums of money were expended by the Consolidated Poe Mining Company for the development of the Poe ledge and for hoisting and reduction equipment, according to Whitehill (1873).

John Waldes and associates leased the property in 1936 and shipped several small lots of ore to the Utah smelters which were reported by the local press to have assayed about \$16 per ton. Lew Hymers and Sol Lockman controlled the property in 1941 and granted a lease to W. E. Shirley. Couch (1943) gives the production for the Golden Fleece and others as \$148,464 from 29,580 tons of ore. The property was inactive in 1947.

The Mazy or Updike property, is an old claim situated about two miles north of Reno in a crushed and pyritized zone in andesite which strikes N. 10 degrees W., and dips 60 degrees to the east. Two short adits and a shallow shaft expose a few veinlets of quartz with pyrite, galena, and sphalerite. This mineralization is reported by Hill (1915) to carry 0.09 ounces of gold and about 6 ounces of silver per ton. This property has been dormant for many years.

The Nevada Carbon Company controls the ground in which impure lignite occurs northeast of Verdi. Numerous samples were analyzed for the Croxdale organization in 1943 by William I. Smyth in the State Analytical Laboratory, along with a sample run for Judge Frank H. Norcross in 1942. The analyses are as follows:

| | Norcross (1942) | Croxdale (1943) |
|--------------------|-----------------|-----------------|
| Moisture | 12.8% | 27.1% |
| Volatile | 38.4% | 29.0% |
| Fixed carbon | 25.2% | 23.3% |
| Ash content | 23.6% | 20.6% |

The sample analyzed for Norcross had been exposed to the air for several years and thus differed from the fresh Croxdale sample.

The Nevada Central property is located about four miles west of Reno on the south slope of Peavine Mountain. The mineralization there is a mass of hydrothermally altered quartz monzonite about 1,500 feet wide and one-half mile in length, in which pyrite and a little chalcopyrite occur. This zone is interlaced by stringers of pure pyrite and a little quartz. The property was developed by a 600-foot crosscut adit and an abandoned shaft of unknown depth.

The Nevada Industrial or Kirman placer is on the northeast slope of Peavine in the southwest quarter of section 16, T. 20 N., R. 18 E. The pay gravels occurred in a narrow ravine about 1,500 feet in length and from two to four feet in depth. They were mined between 1876 and 1881. Apparently the placer gold was derived from weathered auriferous pyrite in the altered quartz monzonite cut by the upper end of the drainage.

Nixon-Nevada Mining Company in 1915 to 1920 operated the Granite Hill mine situated about 14 miles northwest of Reno. The claims included 840 acres on Peavine and also 50 acres at Big Mouth Canyon near the Pyramid Lake road north of Wadsworth. The Granite Hill mine has a 300-foot vertical shaft sunk on the Number One vein and a 120-foot crosscut to the second vein, according to Weed (1920), who reported in 1924, a small production of 30 percent copper and \$12 in gold and silver values mined prior to 1920. The ground was held in 1928 by the Copperfield Mining Company according to the Mines Register (1937).

The Peavine Silver Corporation was organized in April 1921 to reopen the old Paymaster mine under option to the company. The property consists of two unpatented mining claims which are located approximately six miles northwest of Reno at Poeville. The corporation sank a 160-foot shaft on the property, and an old shaft, 150 feet deep with 250 feet of lateral workings is also included in the development work which exposes a flat dipping fracture zone 20 feet wide.

The Reno Mizpah, an inactive claim, is located about two miles north-northwest of Reno in a north trending silicified zone in andesite. These zones contain a little pyrite which Hill (1915) states carries a little gold value. The property was developed by a few surface pits and a 600-foot crosscut adit, which was driven to cut under the largest outcrop. The heading of the adit is caved and probably did not reach the silicified zone, judging from the material found on the dump.

The Reno May is an old property located between the Mazy and the Reno Mizpah. The vein on this property strikes N. 10 degrees E., and dips about 60 degrees to the east. The old development consisted of a few surface pits.

The Reno Rule, also an old location, is situated about three miles northeast of Reno and two miles east of Fulton's quarry. Hill (1915) states this property was developed by a 400-foot shaft sunk in altered andesite. No production is reported from this property.

The Red Metals Company controlled 16 unpatented claims

located about 15 miles by road northwest of Reno and approximately two and one-half miles northwest of Peavine summit. The property was first opened in 1866 for silver ore, and the Red Metals Company in 1910 developed the property through a 1,200-foot adit. In 1915 Charles B. Bills, of Pioneer Fruit Company in Sacramento, California, acquired control of the property and planned to install a copper leaching plant which did not materialize. Hill (1915) states the ore occurs in overlapping lenses of crushed quartz and wall rock, which lie parallel to the schistosity of the inclosing meta-volcanics. The development adit is driven S. 34 degrees E. for 600 feet, at which point a fifty-foot raise intersects the above-mentioned ore. Oxide minerals predominate which show occasional kernels of bornite more or less altered to chalcocite. Hill (1915) reported the occurrence of some light blue copper phosphate as a film of radial grouped needle-like crystals. Possibly these are either cornetite or pseudo-malachite. The production for this property is given by Couch (1943) as \$11,381, extracted from 793 tons of ore mined in 1912 and 1913.

The "Rokada" diatomaceous earth deposit is a dense endurated buff-colored diatomite, which is situated about one mile northeast of Verdi. The color and quality of this rock is probably due to volcanic action. The Rock Products Company, organized by Mr. Walmsley and Judge Frank H. Norcross, in 1926, produced magnesite flooring and interior finishing products, using this buff diatomite as a filler and pigment. The resulting product had a pleasing color and obtained resilient strength, but failed due to pitting caused by differential wearing away of the softer diatomaceous earth aggregate.

The Standard Metals Company from 1916 to 1922 carried on operations on 240 acres of patented claims situated near Poehville which is about eight miles northwest of Reno. These claims were worked as far back as 1867.

The mineralization occurs in veins cutting the schist formation which is in turn traversed by porphyritic quartz monzonite dikes. The ore is pyritic, carrying gold, silver, and copper values, with a little lead and zinc. The company developed the mine by an inclined shaft to a vertical depth of 300 feet, and built a concentrating plant in 1920, which employed both Wilfley tables and flotation units. Weed (1922) reports about 160 tons of concentrate was shipped having a gross value of \$125 per ton.

The Washoe Copper Company in 1917 controlled 695 acres of mineral land adjacent to the Nixon-Nevada holdings at Copperfield, situated on the northeast slope of Peavine Mountain. This

company was later merged with the Nixon-Nevada Copper Corporation.

The Homestake and Mars claims are right on the State line about three miles north of where the highway north of Reno crosses this line. According to Erich J. Schrader (1947) they were worked by Boston capital in about 1900. A 150-foot shaft was sunk on a narrow gold vein and a Huntington mill installed. Over 20 years later a lower adit was driven by another company.

In about 1904 L. T. Brockbank located an adjoining claim from which he states he took out several thousand dollars in gold ore.

Several metal reduction plants were constructed in early years in or near Reno to treat ore from the Pyramid and Peavine districts. The site of one of these plants can be observed northeast of Reno's rodeo grounds near Highway No. 35 where the soil is still red from the English mill tailings, which mill was situated in the town of "Auburn." The old town is shown on a map prepared in 1867 by Andrew J. Hatch. This map, now in the Mackay School of Mines Museum, also shows the location of a smelter in Laughtons Valley near the south quarter corner of section 33, T. 21 N., R. 18 E., and another small smelter was built at Poeville.

The Reno Smelting Mill and Reduction Works was located on the Truckee River about one-half mile below the present gravel pit of the Ready Mix Concrete plant. H. H. Beck, A. H. Manning, Archie Farrington, John Howell, and M. Carey organized the company in 1866 and built the plant consisting of a 10-stamp mill for free milling ores, a Howell chloridizing-furnace for silver ore, and a complete thirty-ton capacity water-jacketed lead smelter. The Engineering and Mining Journal for November 1886 reports the following schedule paid for ores by this plant, which are interesting for the tenor of ores listed:

Base milling ore up to 300 ounces per ton value, pay for 90 percent of the assay value of the gold and silver.

Base milling ore 300-500 oz./ton, pay for 93 percent of the gold and silver.

Base milling ore over 500 oz./ton, pay 95 percent of the gold and silver.

A charge of \$14 per ton was made for all milling.

Lead smelting ore up to 55 percent lead, pay for 90 percent of the lead, gold and silver and charge \$14 per ton.

Lead smelting ore over 55 percent lead, pay for 90 percent of the lead, gold, and silver and charge \$10 per ton.