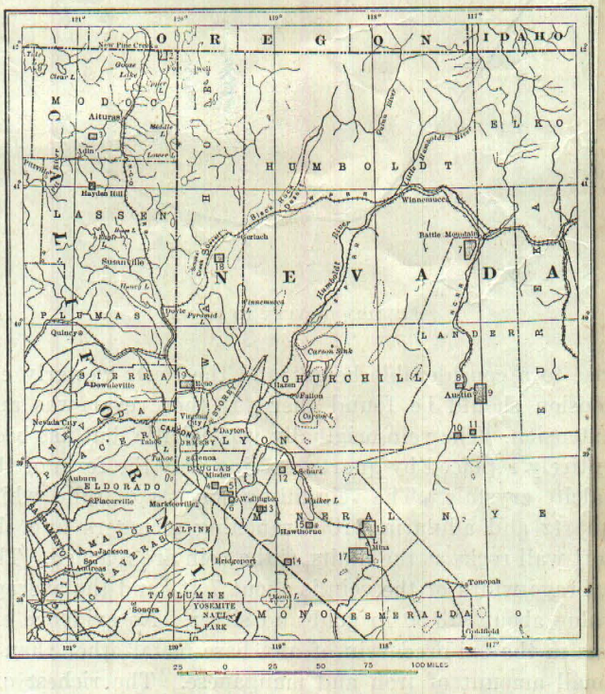
Nevada's Latest Gold District

By Fred. J. Siebert

The camp of Olympia (which name must be changed on account of post-office objections) is situated 25 miles north-easterly from Mina, Nevada, in Mineral county, near the Nye county-line and at the extreme northerly end of the Cedar Range of mountains.

The principal claims, nine in number, were located in January 1915 by James P. Nelson, a prospector of many years' experience, and the most able, hard-working, and conscientious prospector I have ever known. Nelson named them the Royal George group. The ground had been located many times before but the rights had been allowed to lapse. In the higher hills there are many showings of quartz-veins in a later flow of rhyolite, which capped, to some extent, the older flows of rhyolite, andesite breccia, and biotite andesite. These veins strike east and west, and what little ore is contained in them seems too spotty to be profitable, so far as they have been developed. It was not until May 1915 that Nelson, after most careful prospecting, found on the Royal George No. 4 claim the obscure outcrop of a vein striking north-west and south-east in the older underlying rhyolite, near the base of the hills and dipping under them. By careful panning and sampling fresh signs of this vein were found for about 200 ft. along the strike. The actual outcrop was found in only two places about 65 ft. apart and assayed from $15 to $90 across an average width of about 7 ft., the assays running in the ratio of one ounce of gold to one and one-third ounces of silver. This vein was heavily capped to the south-east by Siebert Lake-beds,* which cover large stretches of the country below the elevation of the camp, 5975 ft. above sea-level. North-west the vein was covered by occasional patches of lake-bed, soil-wash, and laterite. After the strike was made known the usual trouble with claim-jumpers was gone through, and the absurd demands of our mining laws appeased through the usual 'cash' channel through the attorney's pocket. The ground was then purchased from Nelson by the Olympic Mines Company, a close corporation owned largely in San Francisco. Prior to this, development work was started by a partnership of four men who held a bond on the property. This development consisted of a shaft inclined with the vein at a dip of 43° to the 150-ft. level, where the vein turns off flatly, the shaft continuing on the same dip to a depth of 225 ft. and of levels at 100, 150, and 200 ft., besides cross-cuts, raises, and winzes, the total development amounting to date to about 2000 ft., most of which is in ore. In so far as the vein-bearing formations are concerned, practically all of the surface is totally obscured either by lake-beds, soil-wash, laterite, or flows of later rhyolite and andesitic breccia. At one point on the strike of the vein and 930 ft. south-east of the shaft, remnants of outcrops are found imbedded in a hot-spring deposit that shows gold quite plentifully by panning.

Underground, four different rock-flows are found, all of which dip north-east at about 20°. The vein is a fissure crossing the oldest flow of rhyolite until the 150-ft. level is reached, where in places andesitic breccia forms the foot-wall. Usually, however, the vein is wholly within the rhyolite and for some distance only a few feet of rhyolite intervenes between the foot-wall and the underlying andesitic breccia. The workings disclose a strong, well-defined, normal fault striking north and south, and dipping east at an angle of 50°. This fault has had a remarkable effect upon the shape of the vein, as this sketch will show.



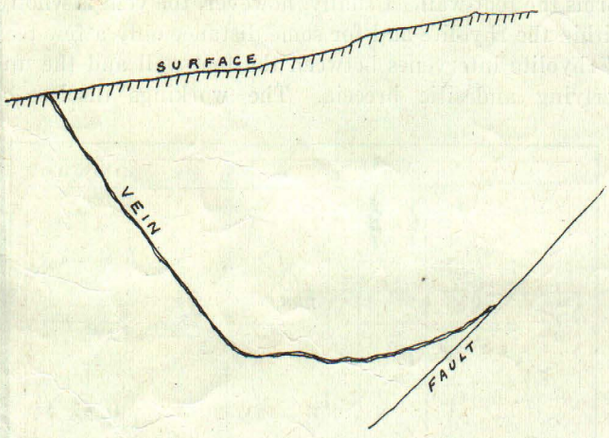
MAP OF A PART OF CALIFORNIA AND NEVADA.

As the strike of the vein is N 40° W, and the strike of the fault N 7° W, the vein is synclinal in form, with the axis of the syncline coming to the surface toward the north-west, where it forms a junction with the fault and the vein. Toward the south-east, however, the syncline becomes deeper and the vein has much greater extent between the surface and the fault. One would naturally expect that from the point where the vein turns to an almost horizontal position, and up to the main line of faulting, there would be a great number of

*Named by Spurr, U. S. Geol. Sur., Prof. paper No. 42, 1905.

minor faults parallel with the main fault and also a broken condition of the vein, but no such condition exists. There was no hint of the fault until it was actually encountered, which seems to prove that the fault was very slow-moving, and the rocks in a plastic condition. From underground observation it would seem that this fault was contemporaneous with vein-formation. Evidently, however, the movement along the main line of faulting continued after vein-forming action had ceased.

Development work on the foot-wall side of this fault has not proceeded far enough yet to find the other end of the vein, but it has proceeded far enough to prove that the throw is over 60 ft. It is quite probable that a portion of the vein toward the north-west has been entirely eroded, but in a south-easterly direction the hills



RELATION OF VEIN TO FAULT.

rise to a considerable height and the south-westerly extension should be found there, if there ever was any extension. The vein originally was calcitic, but has been entirely replaced by quartz, leaving only the form of the calcite crystals. The vein-filling consists of solid white quartz and adularia with branching stringers into the soft wall-rocks as the limits of the vein are reached. The average width of the vein is about 7 ft., and the average value about $23.50 in gold and silver. No evidence exists in the oxidized vein of any base metal other than a small amount of iron and manganese. The richest ore is chalky white, with no sign of mineralization. The gold is finely divided and evenly disseminated. It resembles the ore of the Gold Roads district in Arizona, while the enclosing rhyolite closely resembles the rhyolite at Jarbidge, Nevada. It is coarse-grained with large quartz phenocrysts, has a greenish color, and is well leached near the vein, particularly on the hanging-wall side.

Extensive tests prove that the ore is readily amenable to cyanide treatment after being ground to 200-mesh. An extraction of 98.2% was made by actual mill-test after 6 to 8 hours' treatment. A mill of 70 tons daily capacity is now being completed and is expected to be in operation early in April. Water has been piped 6 miles from an elevation 1500 ft. higher than the mill, which is placed near the collar of the shaft, a low trestle connecting them. The mill is equipped with a 190-hp. Allis-Chalmers horizontal Diesel engine, which will be operated on 24° B. oil hauled from Mina, Nevada. Hendy crusher, ball and tube-mills; Dorr classifier, thickeners, and agitators; Oliver filter; and Merrill precipitation equipment constitute the plant. The assay-office and refinery are housed in the same building with a dust-tight partition between. This building is about 300 ft. from the mill and the pregnant solution is pumped up to it, the barren solution returning by gravity to the mill-supply tank.

The mill conforms in every way to ordinary up-to-date cyanide practice, the only extraordinary equipment being the Dorr classifier, which is 6 by 22 ft., and three Dorr thickeners, each 32 by 12 ft. Owing to the colloidal nature of the ore, a large settling-area with a dilution of about 10 : 1 seems advisable in the classifier, and for the same reason 30 sq. ft. settling-area per ton per day has been provided in the thickeners.

STRONTIUM is in more active demand at the present time than for many decades. The sudden increase in its use is due to the need of the brilliant red color in signaling with fires, rockets, and the like; furthermore, the oxide is employed in the extraction of saccharine matter from beet sugar, an additional recovery of 6 to 8% being obtained by this method over the results by the older processes. Germany and Russia each use about 100,000 tons per annum of strontium hydroxide in the sugar industry. It is adapted to a like use in refining cane sugar. The more desirable strontium mineral is the carbonate (strontianite), but the sulphate (celestite) is more abundant and can be sold in large quantities at about $12 to $14 per ton at the Atlantic seaboard. Celestite occurs to some extent in limestones and sandstones of Ordovician and Silurian age; occasionally also in similar rocks of later times. It is often found associated with deposits of gypsum, and is not uncommon as a gangue mineral in lead and zinc ores. Strontianite is likewise found in limestones, but more frequently in veins as an associate with barite, calcite, and pyrite. In many fluorite deposits it also appears, especially when barite is also one of the associated minerals.

LORENZO SUNDT, writing in *Economic Geology*, attributes the formation of sodium nitrate in the Chilean desert of Tarapacá, to the nitric acid present in minute quantities everywhere in the atmosphere. No electrical theory is required. The soda necessary for the reaction with the nitric acid is derived from the decomposition of the feldspar in the rocks. The reaction is rendered possible by the fogs which form along the front of the Andean range.

WHERE a machine can be run direct by a dynamo it should be done. It not only does away with the first cost and the subsequent wear and tear of a belt, but also it relieves the main shaft of a severe side strain and consequent friction.