7 ft. deep. The operations are carried out as follows: The pulp tank being filled to a certain mark, the forward drive runs the frame into the pulp, the vacuum and slime valves opening automatically as the frame enters the pulp. The vacuum rises steadily to about 20 in., and on roasted sulphide ore a charge of three tons is taken on in four to five minutes. The man in charge then sets the machine going on the fast gear to the wash-tank, the operation occupying one minute. It is this rapid means of transferring the cake into the wash solution that gives to the Ridgway filter its wide scope of usefulness, as it is practically impossible to hold a heavy roasted sulphide cake on for more than 60 seconds without the appearance of cracks, so detrimental to the thorough washing of any cake. After washing for 8 minutes, the machine is set in motion in the direction of the pulp tank, and takes 2 minutes. When the frames are directly over the centre of the shaft and have had sufficient time to dry to 30% moisture, the vacuum valve is closed, and the air-valve opened automatically. The 3-ton cake falls into the chute and is washed by a stream of water to the discharge mixer, and thence to the tailing dump by means of a 7 by 12-in. duplex plunger pump. Costs are from 8 to 16c. per ton.

Rochester Mining District, Nevada

The United States Geological Survey, through F. C. Schrader, geologist, has just made an examination of Rochester, the new and promising mining district in Humboldt county, Nevada, which for the last five or six months has been attracting much attention. The ores are chiefly silver bearing, but also carry gold, which in some of the ore amounts to 50% of the value. They were apparently deposited by hydro-thermal solutions.

Nenzel Hill Deposits

The find in Nenzel hill was made late in November 1912, and the shipment of a couple of carloads of high-grade ore by Joe Nenzel, Frank Schick, and Walt Moynaugh about Christmas started the Rochester boom. In less than a month the hitherto desolate canyon had a reported population of 3000 and contained many substantial two-story frame buildings. Leases on blocks 300 by 600 ft. in area were taken and operated by experienced mining men, with the result that to date the development of the mines and the showing of ore are remarkable. Six or eight leases are opened to a depth of 130 ft. by cross-cut adits from 100 to 300 ft. in length. About 2000 tons of ore averaging $30 per ton has been mined and shipped, and it is said that 100,000 tons of ore in sight. Nearly a score of properties are producing.

The Rochester district lies mainly on the eastern slope of the Humboldt mountains, between 4000 and 8400 ft. in elevation, in a north-south area about 6 miles long by 5 miles wide, on which the Survey will later probably publish a report accompanied by a geologic and topographic map.

The district is easy of access, being 10 miles east of Nixon, formerly Oreana, the nearest station and ore-shipping point on the main line of the Southern Pacific railroad, and 25 miles northeast of Lovelock. With both of these places it has daily freight, express, passenger, and mail auto service and telephone connections. The country is mountainous, but not rugged. The ravines are open, and most of them are passable for team and wagon.

Nenzel Hill Development

Nenzel hill, in which lie the orebodies from which the present production is chiefly derived, is situated in the eastern portion of the district and forms a part of the crest of the range between the head of Rochester canyon on the west and South American canyon on the east. It is a north-northeastward-trending oval part of the ridge, about 3000 ft. long by 2000 ft. wide, and rises to 7300 ft. in elevation, or about 500 ft. above the adjoining portions of the divide. In Nenzel hill the veins, ten or more in number, vary from 100 to 3700 ft. in length and some apparently have a vertical range of at least 400 ft. The west vein or lode, now being worked chiefly on the Codd lease and the Platt lease, is about 32 ft. in width and contains two veins, 7 to 8 ft. wide, of good ore composed chiefly of alternating layers of quartz and silicified rhyolite. The workings on these veins have been entirely in ore.

Lincoln hill, which also contains producing properties and received much attention last winter, is a prominent landmark in the western part of the district 2½ miles distant from Nenzel hill, on the north side of Rochester canyon, above which it rises 1200 ft., or to 6600 ft. above the sea.

Packard hill, the seat of the new 'find,' is in the southern part of the district, at an elevation of about 5800 ft. in the lower part of a broad ridge, and on the trend of the Nenzel hill zone of mineralization.

Ore Deposits

The ore deposits of the district are chiefly quartz replacement veins in fissures and shear zones in rhyolite and rhyolitic rocks which are of great thickness. The rocks vary from felsitic to coarsely prophyritic. They are more or less silicified, devitrified, and sericitized, and were referred by geologists of the Fortieth Parallel Survey to the Triassic period. The rocks dip about 35°E., but the veins dip 60°W. and are approximately conformable with the dominant sheeting and shear structure of the country rock.

The principal camp is East Rochester, with a population of 700, situated at an elevation of 6200 ft. in the head of Rochester canyon, at the foot of Nenzel hill, where about 200 miners are at work. Rochester or 'lower town,' 2 miles down the canyon at the foot of Lincoln hill, has a population of 250, and Packard, the newest settlement, but a few weeks old, at the south base of Packard hill, has a population of about 100, which is daily increasing. Panama, on the northeast near Spring Valley pass, in the head of Limerick canyon, has about a score of people.

The geology of Rochester, Nevada, was described by J. Claude Jones in the *Mining and Scientific Press*, May 17.