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mass is ground and agitated in a grinding-pan, the reactions being hastened by the injection of live steam. Thus the work which required two weeks in the patio was accomplished in several hours in the pan. The process is now being superseded everywhere by cyanidation, and it will soon become interesting only to the metallurgic antiquary. The interior of one of the old Comstock mills, the California, is shown in the accompanying illustration.

The Ward shaft pumping plant is designed to be the largest of any precious metal mine in the United States. One 800-hp. unit now temporarily installed on the 2475-ft. station is direct-connected to an electric motor and runs at a speed of 196 revolutions, or 523 ft. of plunger speed per minute. The behavior of this pump in a long test by practical operation will have an important effect upon the future design of large electrically driven mine pumps in this country.

During the past few years a great deal of necessary 'dead work' has been accomplished. The men on the Comstock believe that the fiftieth anniversary of the discovery of the lode marks also the date of its substantial rehabilitation, and that the mechanical and metallurgical improvements which have lately been made there will enable the miners of today to work the low-grade ores and to explore in search of bonanzas those portions of the lode which the men of thirty years ago were unable to enter.

JEFFERSON CANYON, NEVADA.

Written for the MINING AND SCIENTIFIC PRESS
BY GEORGE A. PACKARD.

In Nye county, Nevada, five miles easterly from the new camp of Round Mountain, and 50 miles north of Tonopah in an air-line, is the old camp of Jefferson. For nearly forty years the stage from Austin to Belmont followed the road up Jefferson creek from the Big Smoky valley to the summit of the Toquima range, but after the opening of the mines of Manhattan and the discovery of Round Mountain, the route was changed, and a detour made to the south to include these places. During the seventies several mines were worked in Jefferson canyon, which was then known as the Concordia or Green Isle mining district. The largest producers were the Jefferson and the Prussian companies, owning adjoining claims, the Prussian South and Prussian, on the same lode. This vein has a northwest strike, with a dip to the northeast of about fifty degrees, and has been traced for several thousand feet. It lies between a porphyry hanging wall and a slate foot-wall, though the occurrence of slate is limited. To the southwest quartzite may be seen overlying limestone, and this in turn lies upon granite. In passing up Jefferson canyon this hanging wall porphyry shows two rocks quite unlike in appearance, one a very light brown, the other gray in color. Microscopic examination of slides shows, however, that these are not materially different. Both may be termed rhyolite, and show a strongly marked flow-structure, as does the country rock at Round Mountain, which they closely resemble. The darker shows, with the high powers, a ground-mass, once glassy, of indistinct crystals crowded with decomposition products

such as kaolin and calcite. The quartz phenocrysts which are fairly abundant, are large, and are generally somewhat rounded crystals. More abundant than these are the crystals of albite, now largely replaced by calcite. The rock also shows orthoclase, biotite altered to chlorite, and grains of magnetite. The ground-mass of the lighter rock is similar to that of the darker, except that it is more discolored with ferruginous matter, which also appears in the phenocrysts. There is somewhat less calcite.

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Alexander Trippel, reporting on the Jefferson and Prussian properties in 1881, says: "It has been stated that the two mills shipped a million dollars worth of bullion; for the absolute truth of this statement I cannot vouch, but to my own personal knowledge \$200,000 worth was produced during one year. Both companies worked their mines by means of inclined shafts sunk on the vein, the Jefferson company to the depth of 700 ft., and the Prussian to the depth of 250. The width of the vein varied from 2 to 7 ft., with a smooth and regular wall on either side. The ore was not uniformly distributed, but was found in obliquely inclined chimneys several hundred feet in length, between which the vein was either low grade or barren." These properties have not been worked since 1876, except for a short time by lessees. Apparently they were closed because in depth the amount of water increased and the ores became too 'base' to work by methods then known. The ore in this vein contained silver chiefly, and at water-level sulphides and sulphantimonides were found.* In the hanging wall porphyry are a number of veins which have been held and worked by a single miner for over thirty years. Some of these parallel the Prussian vein, but others are apparently nearly at right angles. In doing some 4000 ft. of work, ore yielding many thousand dollars has been sorted and shipped, but the bulk of the ore is comparatively low grade. Recently two New York men have acquired control of this property, and are erecting a mill. This ore differs from the ore of the Prussian contact-vein in that it carries more gold than silver, though the proportion of silver is larger than in the ore occurring in the similar porphyry at Round Mountain. There is also some work being done to the southwest of the Prussian vein, on the contact of the granite and sedimentaries.

Wireless stations are to be erected in the interior of China. The difficulty of establishing communication by telegraph across the deserts between Peking and the extreme northwest of the Empire is to be surmounted by the installation of an extensive wireless system under the control of the Chinese Government. The Board of Posts and Communications is now making investigations as to the best system to adopt.—*Far Eastern Review*.

The lower limit of manganese steel is determined by the fact that alloys between 7½ and 5½% of manganese are weak and brittle. The characteristic strength and toughness can only be given to steels having more than 8 per cent.

*Mineral Resources of the United States, 1875, p. 281, and 1876, p. 128.