

to be cut by quartz-veins of greater width, which hold visible gold. The association of metalliferous quartz-veins with masses of granite or other intrusive rocks traversing sedimentary deposits is a fact of general observation. Had the higher portions of the rocks, which may at one time have completely covered this particular granitoid intrusion, remained, it might be anticipated that it would be found to pass upward into one or more ordinary auriferous quartz-veins, these filling fissures through which the heated waters ultimately reached the then surface. In depth the present ore-mass should be found, on the other hand, to pass gradually into ordinary unaltered granite. Many cases of course occur in which intrusive masses have led to the formation of metalliferous veins without producing extensive low-grade metalliferous deposits of an intermediate character, such as the one here naturally exposed by subsequent processes of denudation appears to be. This deposit therefore affords an interesting example of the manner in which intrusive masses may directly give rise to ordinary metalliferous veins.

The quantity of gold contained in the ore of the Treadwell mine is small. Though not informed as to the actual yield, I believe it to be on the average less than \$10 to the ton. The ore is, however, easily and cheaply obtained by work resembling quarrying rather than mining, and can in consequence be profitably worked on a large scale. It is not intended here to enter into particulars as to the mode of working, but it may be stated that at the time of my visit 120 stamps were constantly employed, and that since that date this has been increased to 240, the quantity of ore milled daily being now reported at from 500 to 600 tons. A considerable proportion of the gold is "free" and this is saved on amalgamated plates. The remainder is contained in the iron pyrites, which is separated by Frue Vanners. The pyrites was then formerly roasted in revolving cylinders, but these were being replaced at the time of my visit by continuous automatic furnaces similar to those employed in sulphuric acid works. The gold is dissolved from the roasted product by chlorine gas, and precipitated by sulphate of iron.

As the geological conditions are very similar along the west coast all the way from Lynn canal to the strait of Fuca, it appears highly probable that other deposits of a similar char-