

and about 800 feet on the incline of the bed, below the surface. The pumps have a six-inch bore with a seven-inch column, but they only work three hours in twenty-four, so little is the mine troubled with water. On reaching the surface the bed-rock undergoes a sorting and about one-third is set aside as worthless. The other two-thirds are roasted in huge heaps much in the same manner as iron-stone. The object of this operation is to render the rock more easily pulverized. After roasting, the larger masses of copper are sorted out and sent directly to the furnace, where they yield about 60 per cent. The remainder is forwarded in waggons, on an inclined tram-way (where the full waggons in descending pull up the empty ones) to the stamp-work situated close to the lake, below the village of Hancock. Here Wayne's stamps, Shiermann's jiggers and ordinary Cornish buddles are employed in concentrating the ore. Each stamp weighs 900 lbs., and has 16 inches lift. The stamped rock passes through a sieve made of boiler plate, $\frac{1}{4}$ inch thick. The holes are $\frac{1}{4}$ inch in diameter, and have a slight diminishing taper towards the stamps. The latter are stopped every eleven hours in order that the larger pieces of copper may be removed from the stamp-box. The stamped ore is discharged into a shallow run which has an inclination of a half inch in a foot. From this it comes on to a sieve which is constantly in motion, has $\frac{1}{3}$ inch holes, and separates it into coarse and fine work for the jigger. The fine work in passing down into the jiggling sieve meets an upward current of water which carries away the slimes from it. The jiggling machine, in which the sieve is stationary, apparently cleans the ore very effectually. A sample of the coarse raggling from it was given me which assayed 98.6 per cent., while the *skimpings* or refuse contained only 0.6 per cent. The fine *ragging* from the same machine assayed 89.3 per cent. and the refuse 0.73 p. c. The product from washing the finer stuff on the buddles assayed 78.6 per cent. while the *tailings* from the same operation gave 0.46 per cent. The whole of the refuse products of the stamp-work are, however, passed through an adjoining building, and some part of them worked over. The yield of the rock treated in the stamp-work was, during 1864, 2.96 per cent. I make no attempt to describe the magnificent machinery of the Pewabic and Franklin stamp-works where Ball's patent stamps and washers are employed. To judge, however, from the percentage of copper in the refuse products, the work is not so well done here as in the Quincy stamp-works. With the permission