

are to be found within say five miles of the towns of Hancock and Houghton on Portage Lake. Even the professional visitor, who has given previous attention to the subject, cannot but be astonished as he rounds the point beneath these towns, and sails up to them, at the scene of life and activity which suddenly opens up before him. Having only spent ten days in the district, it would be impossible for me to attempt to describe with a moderate degree of minuteness even its principal mines. There are at least twelve mines in operation within a short distance of the lake, and of these the majority are producing copper in quantity varying from 20 to 120 tons of the pure metal monthly. The mines which have the largest production are those of the Pewabic lode, and it will be sufficient to refer briefly to their mining and dressing operations.

In exploring the cupriferous bed in the Quincy mine, as in following the other beds in the district, the miner has only its lithological character to guide him, there being no distinct joints or walls on either side. The shafts, levels and winzes of the mine are all opened within the bed so that the amount of *dead work* done is the very least possible. At the 100-fathom level the strike is N. 30° E., and the dip 70° north-westward. The shafts on the Quincy mine are from 200 to 300 feet apart, and the levels from 72 to 75 feet beneath each other on the incline of the bed, and 60 feet perpendicularly. The width of the bed is from 6 to 30 feet and the average thickness ten feet. According to the general experience at the mine, the thicker the bed the richer is the rock in copper. About two-thirds of the area of the bed is removed as remunerative; the other third, although it may contain some copper, is left standing, as unworthy of excavation. The amount of ingot copper yielded by the ground actually removed in 1864 was 562 lbs. per cubic fathom. Assuming the sp. gr. of the rock of the lode to be 2.7, it thus yielded 1.4 per cent. Of course the copper was unequally distributed through the bed rock, and the true per centage would be at many places above, and at others below that just mentioned. The bed is excavated by a very judicious combination of over-hand and under-hand stopping. The rock is removed to the shafts in waggons containing about one ton each, and hoisted in *skips* or waggons of a peculiar shape, running on tracks in the inclined shafts. The contrivance whereby these skips are emptied on their reaching the surface is without doubt the simplest and most beautiful anywhere in use. There are six shafts; the deepest, No. 4, is 660 feet vertically,