

THE CALUMET AND HECLA COPPER MINE.

BY WILLIAM P. KIBBIE.

The Calumet and Hecla Mining Company, proprietors of the richest copper mines on the face of the earth, employ upward of five thousand men. The monthly pay roll reaches the enormous sum of \$400,000. Its annual receipts average \$14,000,000, from which dividends at the rate of \$20 per share are annually declared, and have been paid with but few interruptions during the past ten years. The total dividends paid by the company since its organization in 1867 amount to about \$46,350,000.

The total receipts of the company to date amount to more than \$365,000,000.

The official statement of the company for the year 1894 was as follows: Amount invested in real estate, \$6,354,690.40; amount of personal estate, \$6,054,216.16; unsecured or floating debt, \$812,123.99; amount due corporations, \$5,464,670.59; production of refined copper, 79,769,293 pounds.

The belt of the Calumet copper-bearing conglomerate lies in Township 56, north of Range 33, west of the meridian of Michigan. Overlying the vein is a cupriferous amygdaloid rock, while its floor or footwall is composed of trap rock.

"The first original opening to discover this vein and determine its value" was made in the latter part of August and the first ten days in September, 1864, under the superintendence of Mr. John Hulbert. The report of the discovery of the Calumet conglomerate was made by Edwin J. Hulbert to a Mr. Weeks, secretary of the Hulbert Mining Company, on the 10th day of September, 1864. The first barrel of conglomerate was shipped away on September 11 of the same year, when it was sent to Boston parties to test the truth about the vein carrying 4 per cent copper. The first active mining by the present company was begun in 1867, in which year the initial shipment of 768 tons of copper was made. From that year the product of the great mine kept on increasing, till now the annual shipment has reached the enormous weight of 95,466,478 pounds of copper.

To illustrate the position which this company holds on the copper market it may be mentioned that, of the 64,870 short tons of copper mined on the lake during 1895, the Calumet and Hecla produced 38,720 short tons, or more than one-half, and taking the combined product of all the Lake Superior mines since 1856 up to the present year, we find that the Calumet and Hecla has produced two-thirds.

The conglomerate formation in northern Michigan, extending from Portage Lake northwesterly to Keweenaw Point, and thence across Lake Superior to Ontonagan, is a conglomeration of pebbles in solid form with an intermixture of pure native copper. The productive part of this master vein lies in the southeast quarter of Section 14 and the northeast quarter of Section 23, South 56, Range 33.

The method employed in mining this vein is as follows: The shafts proper, which reach to the bottom of the mine, are timbered from base to summit, pine timber being used clear through. Levels are uniformly ninety feet apart, which afford access to the different parts of the mine. Through these levels the copper rock is brought to the main shaft by tram cars, that switch to and from the different openings. At the intersection of each level the ore is dumped into the skip, which runs up and down

the main shaft at a speed of 600 feet per minute. At the summit the skip rises to the top of the rock house, where the ore is automatically dumped into the ore crushers, thence into the ore cars, whence it is carried to the mills for treatment. The vein is punctured by diamond drills, the average depth of each hole being five feet. Into these holes are inserted dynamite cartridges, at the end of which a cap is fitted. Attached to the cap is a length of fuse—ten feet. When this is

pressed with the idea that he is inspecting a literal exposition of machinery. No other mining company can begin to cope with it in the amount of horse power employed. The great Superior engine of 4,500 horse power; the twin engines, Minong and Mesnard, of 3,000 horse power each; the four triple expansion engines of the Red Jacket shaft, having a combined capacity of 8,000 horse power; the South Hecla engines of 5,000 horse power, and the grand array of other machinery,

including electrical and hydraulic, makes the visitor wonder if so much grand mechanism is necessary. The surface workings cover an area of two and one-half miles, which is completely dotted with imposing structures, behind whose four walls grind day and night the ponderous machinery, and above which tower the huge smokestacks, built of solid masonry, some of them lifting their heads 255 feet into space.

(To be continued.)

Origin of Tattooing.

What is the origin of this usage? Religion, which has so much power over peoples and which proves so obstinate in preserving ancient customs, has certainly contributed to maintain it among the more barbarous part of our populations; we see a quasiofficial proof of it at Lorette. Those who cultivate a devotion for a saint believe that by engraving his image on their flesh they will give him a proof, a clear testimony, of their love. We know that the Phenicians marked the sign of their divinity on their foreheads (Ewald, *Judaischen Alterthum*, iii). In the Marshall Islands they have to ask the permission of the gods to tattoo themselves, and the priests alone in

New Zealand perform the office of tattooing (Scherzer). Lubbock adds to this that a woman who does not wear a tattoo mark cannot enjoy eternal felicity. The women of Britain tattooed themselves in obedience to religion (Pliny, 33).

The second cause is the spirit of imitation. A Lombard soldier answered me laughingly one day when I rallied him on his having spent a small sum to spoil his arm: "See, monsieur, we are like sheep, and when one of us does anything we all imitate him at once, even if we risk doing ourselves harm."

Love of distinction also has its influence. A thief of the most incorrigible sort, who had six brothers tattooed like himself, implored me, although he was half covered with the oddest tattoo marks, to find him a professional tattooer to complete what might well be styled the embroidery of his skin. "When the tattooing is very curious and spreads all over the body," he told me, "it is to us other thieves like the black coat of

society with decorations—the more we are tattooed, the more we esteem one another; the more a person is tattooed, the more influence he has over his companions. On the contrary, one who is not tattooed has no influence; he is regarded simply as a good fellow, and is not esteemed by the company." — Appletons' Popular Science Monthly.

TUBERCULOSIS is affected by the Roentgen rays, according to MM. Lortet and Genoud's report to the Academie des Sciences. They inoculated eight guinea pigs with tuberculosis virus, then exposed three of them for an hour daily to the rays during eight weeks. The five who were kept from the rays developed abscesses and their health was deranged. The three kept in good health and grew fat on the rays.



METHOD OF TIMBERING IN THE CALUMET AND HECLA COPPER MINE, 4,650 FEET BELOW GROUND.

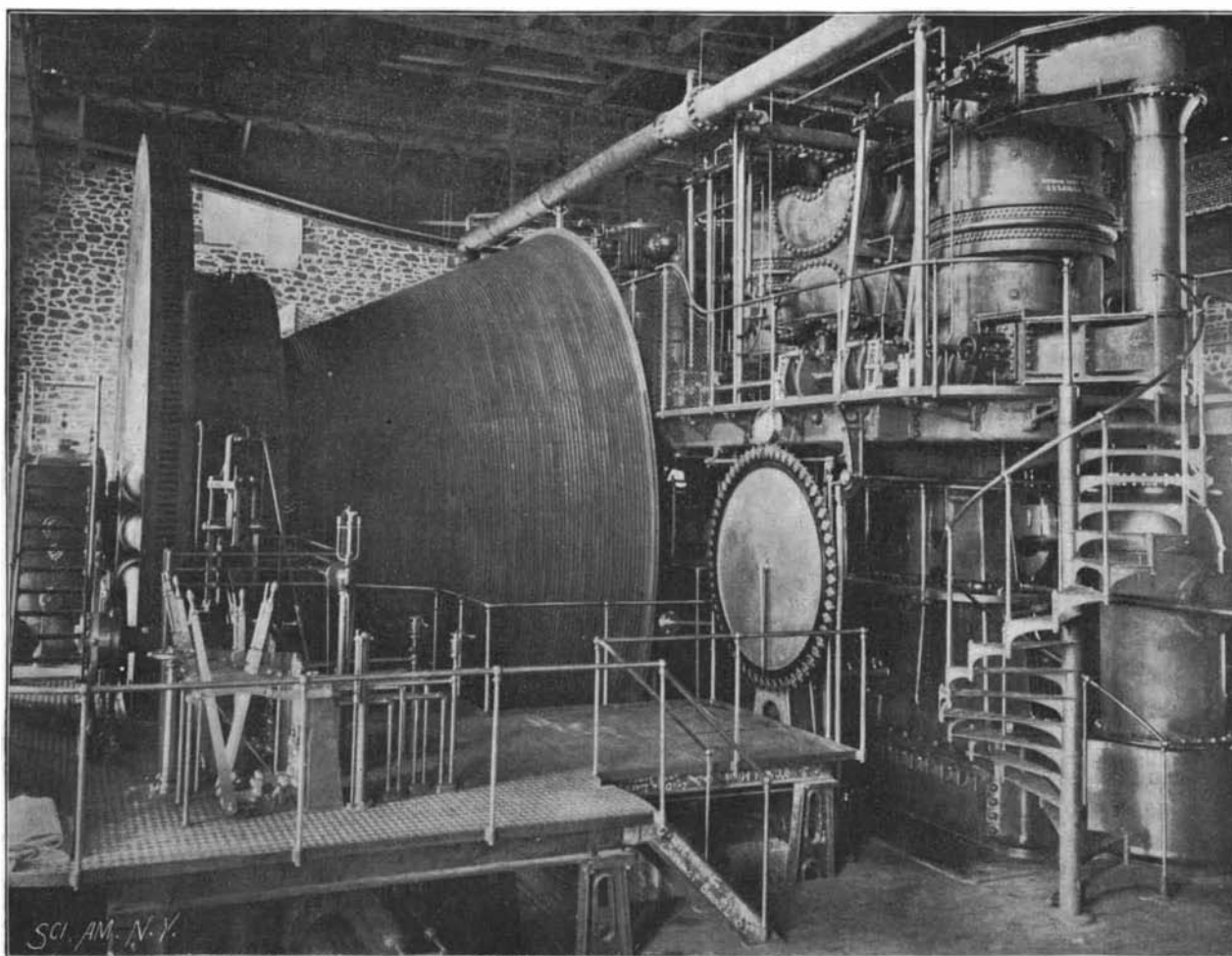
all in readiness the bed is charged and fired, and the broken conglomerate is loaded into the tram cars, which convey it to the skip road.

In the Calumet and Hecla mine, some seventy drills are operating, and they blast twice a day.

During the forty years of mining on the conglomerate the bed, which averages 12 feet, has never lost its width, while its thickness ranges between 15 and 25 feet. The width and thickness of the amygdaloid vein, however, are very uncertain. Sometimes they are found to measure 25 feet across, while at other times but a few inches. The conglomerate is a dull red in color, while the amygdaloid is a dirty gray.

The characters of both lodes are such that the most economical way to mine them is by slopes. By slopes is meant inclining toward the vein and under it near the foot wall, and working obliquely around it.

Calumet and Hecla Surface Workings.—Looking over the surface workings of this great mine, one is im-



4000 HORSE POWER TRIPLE EXPANSION HOISTING ENGINE, CALUMET AND HECLA COPPER MINE.