

the markings of their cutting implements it is supposed that they probably used copper hatchets. Their perishable implements have been preserved in their old pits, which have ever since been filled with water.

The greatest difficulty of these early miners was to find a means of sinking into the solid rocks and driving horizontal galleries; yet they did so. In many places the upper portions of the veins are particularly soft, being weathered, and these might be removed with comparative ease. But they required something more powerful than their rude hammers to pursue their greater workings—they required means of blasting. The plan adopted was that which has been used in Eastern countries till a comparatively recent date. This consists of an intense fire, made so as to heat the rocks to a high temperature, then cold water is thrown on, and this chills and causes them to crack, after which the miners were able to remove the shattered portions with their tools. By means of this rude method of blasting they sunk many pits to a depth of fifty feet, especially in the Evergreen Range, Ontonagon County. Here also, they drifted galleries from the pits to a horizontal distance of thirty and forty feet; but this required better ventilation to maintain the combustion of the fuel sufficiently rapid to raise the temperature high enough for blasting purposes, and also to get rid of the smoke. These men were, however, even able to surmount this difficulty. They understood the necessity of having two shafts, in order to have a perfect circulation of air, entering by one and going out by the other. Several of these mines with double shafts have been found.

The difficulties of these ancient miners did not end when they had obtained a means of breaking down the rocks; they had no means of cutting up large masses of copper. The smaller masses could be broken up by hammers

and sharp angular stones, but the huge blocks of copper could scarcely be mastered in this way, and as a result several large masses have been found at the bottom of the pits, which, after having detached them from the rocks, they left. One of the most noted was found many years ago in the old Minnesota mine, near Ontonagon where a mass of copper weighing seven and a half tons had been raised on skids and after having the branches battered off, the principal part was left raised on skids, having resisted their efforts to break it up. They do not appear to have been acquainted with the art of casting, as all their implements have been made by hammering the copper, nor do we find any traces of cast copper among the various articles which had passed to the eastern Indians, and been handed down among them as heirlooms.

This somewhat advanced people appear to have been migratory, visiting Lake Superior only in summer, as they have not left any traces that would lead us to suppose that they occupied the country in winter—there being no remains of any such habitations, nor of burial places, &c., which are found frequently in other parts of the continent. Another argument in favor of supposing that these early miners were migrates, consists in the fact that their hammers and instruments appear to have been put away carefully each season, and not left indiscriminately around, awaiting their return in the coming spring, up to the time when they left to return no more.

Their most skillful workings are found near the southern part of the Copper-Bearing Series in the Evergreen Range, Ontonagon County; and those in Keweenaw County, from sixty to eighty miles farther south, are generally only pits, while the recent discoveries on Isle Royale show still less skill. Although immense numbers of their hammers are found on Isle Royale, none of