

The Use of Copper by the American Aborigines

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Early explorers in Canada, New England, New York, Virginia, the Carolinas, and Florida, including Alfonso, Allouez, Champlain, De Soto, Heriot, Newport, Raleigh, Ribault, and Verrazano, all report that the Indians were using ornaments and implements made of copper at the time of their earliest contacts (9, p. 46). The Cabots also observed that the natives "had plenty of copper" (1, p. 6).

Had the site of the great prehistoric copper mining industry not been specifically discovered, its whereabouts could almost have been determined from the gradual increase in the quantity of native copper articles found as the Northern Peninsula of Michigan was approached. Since the distance from the source of supply added to the value and appreciation of the red metal, in the eastern and southern portion of the United States copper was largely used for breast-plates, bracelets, beads, ear spools, and other ornaments (3, p. 715), while spearheads arrow-points, and knives were more plentiful nearer the source of supply and show a gradual evolution from the primitive leaf-shaped, through the stemmed, and finally to perfected socketed forms (7, p. 180).

In addition to axes, chisels, "spuds," and levers of copper, many of the latter eighteen to twenty inches long, the Indians manufactured fish hooks and also used thin copper sheets to cover wooden labrets, ear plugs, and other objects such as wolf jaws and beads of shell, wood, or bone. Many such articles are in the archeological collections, the organic material having been preserved throughout many years of burial by the copper carbonate formed from the metal. In the museum of the Evansville College is a fine example of an elaborate copper helmet or head dress.

Many objects of copper have been found in Indiana, but the center of its greatest use was Wisconsin (9, p. 60), as might have been expected from its proximity to the source of supply. The present relative scarcity of these Indian metallic artifices does not give an accurate idea of the numbers possessed by the aborigines, for doubtless many of them, on account of their value, have found their way into the crucibles of the white man (1, p. 20).

Native copper occurs in limited amounts in a dozen localities in the Blue Ridge Mountains of Virginia and in Person and Rowan counties, North Carolina (3, p. 711), in nearly all the states of the Mexican Republic (8, p. 85), and also in New Mexico and Arizona (6, p. 241). Moreover, masses of float copper were present in the glacial drift in Wisconsin, Michigan, Indiana, Illinois, and Iowa (5, p. 685).

But the Lake Superior region was the source par excellence. There are literally thousands of old mining pits and trenches in the Trap Range which extends through Keweenaw, Houghton, and Ontonagon counties in the Northern Peninsula of Michigan (9, p. 42). The same range dips under the water of Lake Superior and protrudes above the surface in Isle Royale (9, p. 14), which seems to have provided richer rewards than

any other locality. In several places in this region great blocks of copper weighing three, four, and even five thousand pounds have been brought to light bearing the tool marks of the aboriginal miners (4, p. 25).

Two methods of mining seem to have been adopted by these prehistoric people: one, following veins of copper into the solid rock by shattering the matrix with fire, water, and mauls, and the other, of trenching through glacial deposits in search of float copper (9, p. 26). The pits, filled with the debris of an untold number of years, after excavation prove to be from four to ten feet deep and in some cases thirty feet across (9, p. 33). The work required to make these pits with the primitive methods at the disposal of the Indians was perfectly colossal. First the rock surfaces had to be uncovered in order to find the veins where the copper occurred in strings, sheets, and variously shaped masses (3, p. 709) enclosed in the tough rock.

The finding of quantities of charcoal in the pits (5, p. 690-91) shows that the rocks were first heated and then water poured upon them in order to fracture them and to make them more easily pounded to pieces with stone mauls. Wooden bowls for carrying and bailing out water have been recovered from rubbish of the pits together with the remains of birch bark baskets used in carrying out waste material. Pieces of timber thought to have been used as skids and ladders have also been unearthed as well as white cedar shovels, resembling the paddles used by the neighboring Indians to this day for propelling their canoes. Copper chisels and wedges have also been found in these old pits (9, p. 45).

As for mauls, they are strewn over the surface of the ground and throughout the debris on the pits and trenches in such quantities that on Isle Royale alone they are estimated to number at least a million, amounting to a thousand tons of material (5, p. 694). The transportation of these mauls alone, from the ancient beach lines and glacial deposits, entailed a terrific amount of labor. The mauls and hammer stones ranging from one to forty pounds in weight are usually elliptical in shape and are simply unworked cobble stones of granite or other hard material. It is believed that they were held between the hands because there are no traces of grooves for helms or handles (9, p. 33), although in one case a double groove was discovered, which may indicate that it was used by two men working together (9, p. 43).

After wresting native copper from the matrix of these tough rocks, how did the Indians fashion it into tools and into delicate ornaments? Experimenting archeologists have found that untreated copper pounded to a thin edge crumbles, but that, by alternately heating it and dipping it into water, in other words by annealing the metal, it becomes tough and more ductile (9, p. 58-9). This process must have been known to the Indians, possibly developing from finding that copper broken from the rock formations by heating and then chilling with water worked better and more easily than that picked up in the glacial drift.

The aborigines north of Mexico did not mould copper, for even if it could be melted over an open fire, which is doubtful, what material could their crucibles have been made of (7, p. 174)? That the Mound Builders knew and practiced the art of hardening copper so that it was as hard as steel is not true (3, p. 705).

Fortunately metallurgic art has developed to such perfection that none of the above speculations need remain pure theory, for with the microscope it may now be proven that cold-worked copper shows no crystalline structure when polished and etched, being like unprocessed copper nuggets in this respect. It should be observed, in passing, that cold-hammering renders copper harder and more brittle (10, p. 109).

When copper artifacts fabricated by annealing and hammering are polished and examined microscopically, large equiaxed grains appear, and, since mechanical working twists these grains, microscopic examination reveals the method used. Indeed, so accurate have the metallurgists become that, by the appearance of these grains, the temperature attained during the process of making the object can be very accurately determined. Many copper objects of Indian manufacture have been heated to 800°C. (10, p. 111-12), a bright red heat.

Here we have another criterion which archeologists may seize upon to help untangle tribal and cultural problems.

It has been insinuated that some of the most artistic of the copper plates found by Moore in Florida mounds and by Moorehead in the Hopewell mounds of Ohio and the Etowah site in Georgia, originated with Europeans. Happily the science of chemistry has settled that problem beyond all question (6, p. 241). Lake Superior Copper is much purer than is the metal smelted in Europe during the period in question. Lake copper runs from 99.65 per cent to 99.994 per cent pure (6, p. 221). Its content of silver and iron is quite constant, and minute traces of arsenic, nickel, and cobalt are occasionally found, but never lead or bismuth (3, p. 725). European copper is not so pure, and contains ponderable quantities of lead, bismuth, arsenic, and antimony.

It is quite certain that after the discovery the Whites did supply the natives with copper and that the Indians would recover the metal from shipwrecks and capture it on forages of one kind or another, but this material may always be differentiated by the aid of the test tube. In a majority of cases it has been shown to be brass (6, p. 225).

But to return again to the consumingly interesting problem of the ancient mines,—when they were worked, how long they were worked, and by whom? Since early French and Jesuit explorers made no mention of the mining of copper, it is probable that the pits had been neglected and forgotten at that time (2, p. 264). Father Allouez in 1667 found that the savages regarded copper and the region where it was found with the awe and respect due divinity (1, p. 9-10). In addition, the Chippewa knew nothing of mining and had no tradition in connection with it (9, p. 65).

We do know the following:

(1) No mounds or defenses, homes or other traces or evidence of the cultivation of the soil by these old miners have been found (3, p. 707).

(2) Numerous copper articles are found on the village sites and fields of Wisconsin (7, p. 178).

(3) Dr. Warren K. Moorehead took three or four thousand ear spoils of copper from the Hopewell mounds of Ohio alone, and a copper axe twenty-two inches long, weighing thirty pounds, as well as many

other copper articles (1, p. 11-12). He found much copper in the famous Etowah mounds of Georgia.

(4) Village sites have been discovered on Isle Royale where potsherds of Woodland type were discovered as well as skeletal material showing a long-headed tendency (9, p. 39); but, since these camps were over two miles away from the pits, they were probably Chippewa sites occupied long after the mines were worked (9, p. 36).

Based upon the foregoing statements and our knowledge of the subsequent invasions and migrations made by various linguistic stocks in that part of the country, may we not hazard a guess that the miners were a part of the older Woodlands groups who must have taken scores and scores of years to have left so many pits and trenches and who traded their copper with the mound-building nations to the south? These people might very well have been driven off by the first northerly incursions of the Siouan stock, led by the Assiniboiné or Dakota or Winnebego. These latter were then, in protohistoric times, pushed further to the west by the Chippewa driving in from the east (9, p. 66). The mounds in Wisconsin yielding no copper may have been built by either of the two latter stocks, who probably did not follow their predecessors in the production of that metal.

Thus, before the discovery of America the working of the mines may have ceased, the straining toil stopped, the mauls and hammers been discarded, the smooth stone anvils abandoned, the annealing fires quenched, and the art of fabricating and of burnishing copper with rubbing stones and sand and water forever lost.

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