The Prehistoric Copper Artifact Journal

Not For Sale

July 2013

Volume 9 Number 3

GREAT LAKES COPPER RESEARCH
AMERICAS AND THE WORLD

MISSION STATEMENT

Our research mission is to enhance the reservoir of knowledge and understanding about man's early use of copper. We wish to know all we can about his activities and belief systems involving ancient prospecting, mining, trading, crafting and use of copper, firstly in the Great Lakes area, secondly in the Americas, and finally in the world.

In pursuit of this knowledge, Great Lakes Copper Research will:

1. Collect and archive historical documents and research material relating to prehistoric use of copper.
2. Furnish library services and materials pertaining to the early utilization of copper.
3. Equip a museum for public display of copper and copper related artifacts to increase the awareness of, knowledge about and interest in man's early use of copper.
4. Advance the study of early copper and related subject matters by providing facilities and scholarships to students for the study of copper related topics. Make grants to universities and individuals to complete carbon testing and other costly procedures relating to the expansion of knowledge about early copper use.
5. Train and provide public speakers on the subjects of early copper mining, manufacturing and use.
6. Analyze and authenticate copper artifacts for non-profit institutions (without fee).
7. Engage in research and all other tasks to advance knowledge about the early use of copper in man's history.

We believe the study of primeval copper use will significantly increase our understanding of early human development.

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GREAT LAKES COPPER RESEARCH
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PREHISTORIC COPPR ARTIFACT JOURNAL

The World's Only Journal
Dedicated To The Study Of Prehistoric Copper Artifacts

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The Purpose Of Our Prehistoric Copper Artifact Journal

We, the editor and readers of this journal, are all students of prehistoric American Indian copper. We want to know all we can about prehistoric activities and perceptions involving copper: prospecting, mining, production technology, trade, and the perceived spiritual symbolic qualities of both the copper medium and products manufactured from copper. There are many ways to distribute knowledge about the early copper industry and this copper journal is one way.

A wise man once said, "half of what I know is wrong. I just don't know which half." I may write as if I am very sure of myself and all the data I have analyzed, but I am not that wise man. Probably 60 percent (perhaps more) of what I think I know about ancient copper is wrong. Here at Great Lakes Copper Research, we are always reevaluating data, changing and refining our interpretation of facts.

Although we have a big library of books, some published more than a hundred years ago and others written this year, we base most of our research on actual copper artifacts and believe that all copper specimens have a story to tell, truth to reveal, if we can only understand what they are willing to divulge. And for that reason most of our research revolves around and is based upon techniques for rendering truth from prehistoric copper artifacts. Indeed, we spend much time developing and perfecting procedures and honing skills to do just that.

We use more information gathered by men and women like yourselves, field workers, collectors, and archaeologists, than we do from books, which we do not ignore. We need your help!

A Wisconsin Flat Tang Ovate Spear Point
5 5/8 inches in length - Curated by Great Lakes Copper Research

DECLARATION

The officers of Great Lakes Copper Research and your editor of the Prehistoric Copper Artifact Journal, like most of our readers, and nearly all serious students of copper, confirm the following: (1) Our respect for all laws, even those that we find wanting, and those based on bad research and false assumptions; further, we urge all others to do the same, until such laws are changed; (2) we respect private property; (3) we respect history, native Americans, and the ancient artisans who crafted the copper artifact we collect and study; (4) we respect the conservation of all copper artifacts, their provenience, and the private property sites which produce them; and finally (5) we respect those who disagree with us.

Copper and Organic Materials

Copper itself cannot be chemically tested to determine the age of copper artifacts. But good samples of organic materials found associated with copper specimens can be radiocarbon tested to establish creation dates for copper artifacts. Associated organic materials fall into two categories: (1) direct contact associations and (2) indirect associations. Direct contact associations include: (a) organic parts of the copper artifacts themselves, found in direct contact with copper specimens: animal or vegetable bindings, wooden handles and staffs, fishhook lines and bead strings, etc. and (b) other organics preserved by direct contact, which include cache bags, objects wrapped in leather or textile, the fabric or skin of the dead upon which the copper rested, etc. Indirect associations include copper and organic materials found archaeologically close and at the same level, but not in direct contact.

Indirect associations (organic materials and copper) are not so data rich or as dependable as direct contact associations. But in many archaeological excavations, indirect associations are the only organic materials available for carbon testing, dating and analysis. Indirectly associated organic materials include testable carbon found near a copper specimen at the same temporal level, but not in direct contact. Carbon from a nearby fire pit, organics from waste pits or middens, are examples of organics recovered within the archaeological excavation in which the copper sample or specimens were found. But indirectly associated organic materials are not a part of the artifact or in direct contact with copper.

Carbon materials are unique in that carbon can be subjected to radiocarbon testing to obtain dates for the carbon tested. If good carbon samples are used, but found in an indirect association with a nearby copper artifact, we can extrapolate, guess that the age of the copper specimen equals the date obtained from our organic sample. If, however, we get a good directly associated sample of organic material, we have very strong evidence (some might say proof) that the date of the carbon is the date of the copper artifact.

In its preservation of organic materials, the copper medium is also unique. Copper contains copper salts, a crystalline sulfate associated with oxidizing copper, which acts as a germicide preserving organic material associated with copper artifacts, sometimes for several millenniums. Organic materials deteriorate because they are attacked by micro-organisms. Crystalline sulfate, (copper salts), kills micro-organisms which destroy organic materials. Therefore, some organic materials, in direct contact with copper, are thus often preserved, even for thousands of years, and thus available for testing, dating and analysis.

Great numbers of copper artifacts were unearthed in recent years; a few recovered archaeologically, but huge amounts dug from activity sites. Archaeologists regularly search for associated organic materials as a part of the archaeological record. For the most part, collectors do not.

Organic materials provide a number of temporal and cultural clues with the most outstanding indicator being temporal associations for artifact creation and usage. Well preserved handles, cache pouches, spear shafts, hafting materials and other associated organics also contribute to our knowledge about how copper artifacts were crafted and used. These same organic remains help us distinguish one cultural motif from another. Preserved organic materials also add to our knowledge about technologies employed to produce and use copper implements and ornaments. Fortunately, most collections, private and institutional, contain some associated preserved organic materials.

Learning From Organic Materials Directly Associated With Copper

We classify symmetrical blades as projectile points: spear points, arrow heads, atlatl points, etc. Many symmetrical spear points, however, were probably also used as knives. And it is possible, some symmetrical points that we classify as spear points were used only as knives or daggers. As classifying copper artifacts is not an exact science, we follow classifying rules and other protocols to make it less subjective. One rule states, "All symmetrical points are classified as projectile points." But another rule allows us to classify symmetrical points as knives - if evidence indicates knife use. One examples might be wrapped handles. Another might be significant use wear on one side-edge only.

In the case of wrapped handles, we seek out directly associated organic materials to prove our theory that some symmetrical points were actually used as knives or as daggers. And we examine organic handle wrappings on knives to define, in part, the characteristics of organic knife handle wrappings. Two such examples are pictured below. See, Figs. 1 and 2. Both knife handle wrap specimens were probably crafted and used several thousand years ago.

Fig. 1, Vegetable Fiber Knife Handle Wrapping

Fig. 1

Curated by Great Lakes Copper

Fig. 1 has a 1 inch strip of vegetable fibers wound around the handle. This knife is 5 inches long, weighing 3/4th of an oz. and was found in 1922 by the late Roger Rindt of Two Rivers, WI. He found it along the Molaesh Creek, near Two Rivers, in Manitowoc Co., WI. Presently curated by Great Lakes Copper Research, this knife is published in Prehistoric Artifacts of North America Vol. XIX No. 3, 1985. It reads in part, "Three views of a 5" Old Copper Culture knife found by owner at Two Rivers, WI: in sandy soil adjacent to Lake Michigan in 1922. Microscopic examination identifies the fossilized cord on the knife as twisted bark from the American Linden tree. Bark was pealed vertically, cut into strips, twisted to form cordage. Copper salts preserved the binding." Carbon in not tested.

Fig. 2, Leather Knife Handle Wrapping

Fig. 2

Curated by Great Lakes Copper

Fig. 2 has the remains of leather strips wound around the handle. This knife is 4 1/8th inches long, weighing 1 oz. It was found on private property with other Old Copper culture artifacts at the edge of a swamp in 1987, near Calumet, MI. Carbon is not tested or dated.

Petrification and Artifacts

Another, but entirely different method of preserving organic materials, is petrification. In geology, petrifaction or petrification is the process by which organic material is converted into stone through the replacement of the original organic material by filling the original pore spaces with minerals. We have many examples of prehistoric Indians using petrified organic material as if it was stone, sometimes knapping petrified wood as they knapped stone, chipping arrowheads, for example. See figures 4 & 5. Occasionally, Indians may have used petrified specimens as handles for knives. See Fig. 3.

Copper Knife With Petrified Antler Handle

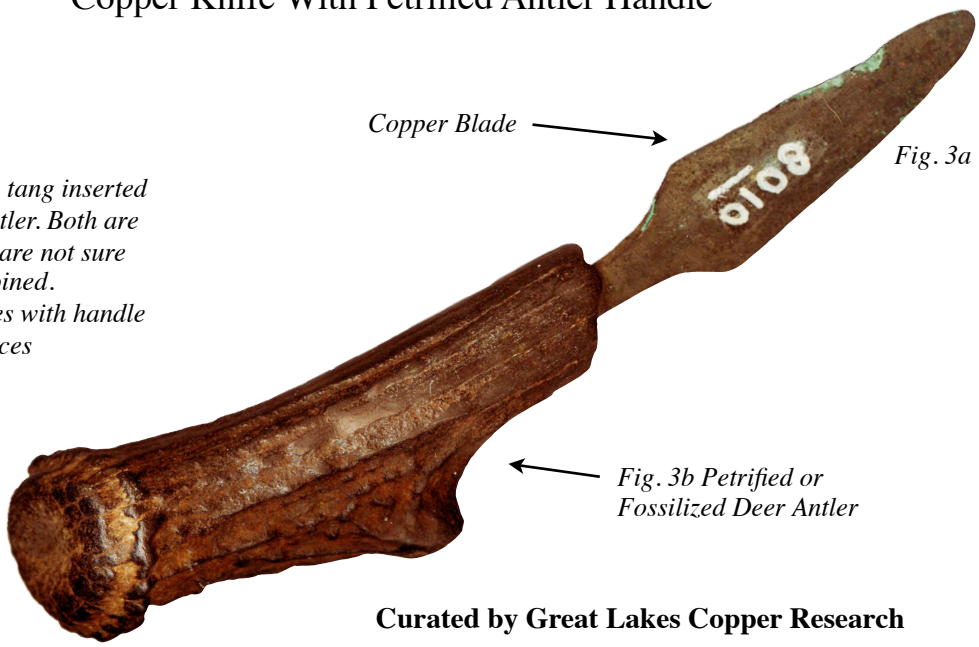


Fig. 3:
Copper knife with tang inserted into a petrified antler. Both are authentic, but we are not sure when they were joined.
Length: 7.5 inches with handle
Weight: 5.25 ounces

Curated by Great Lakes Copper Research

Arrow Heads Chipped From Petrified Wood

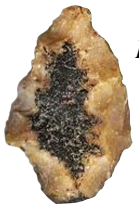


Fig. 4

Fig. 5

Fig. 4 - 5
Two arrowheads chipped from petrified wood

Fig. 6

Fig. 6
Arrowhead chipped around a shell fossil

Petrified artifacts, although once organic, are now permanently preserved. And sometimes the details preserved in petrified specimens are as clear and distinct as when the specimen remained alive. This phenomenon allows us to observe artifacts in details that might otherwise be blurred through time. But no longer organic, artifacts formed from fossils cannot be carbon tested or dated.

The Value Of Analyzing Organic Materials Preserved By Copper Salts

Figure 3 is a symmetrical Diamond Flat Tang Spear Point Type. Taxonomic Copper Classifications Rule No. 6 states; "Symmetrical blades are classified as Points. Asymmetrical blades are classified as Knives. If a preform or blank is symmetrical, symmetrical-like or going symmetrical, it is a projectile point. If the blade is asymmetrical, classify it as a knife." Taxonomic Copper Classifications Rule No. 7, however, instructs us "If a symmetrical blade (classified as a point in rule No. 6) shows evidence of having been used as a knife, it must be classified as a knife, even if this classification violates the rule of symmetry." (Spohn 2007: 30-31)

Nearly all copper spear points were probably sometimes used as knives. The primary uses of some symmetrical blades probably included knife or dagger work tasks. Preserved handles and wrappings add to our knowledge of how tools were used. This (Fig. 3) fossilized or petrified knife handle is very hard, dense and heavy. Both the copper blade and the fossilized antler handle are authentic and very old. As this artifact possesses no archaeological record, we cannot be sure that the handle and blade were joined anciently.

Some of the medium use data we gather from studying organic materials preserved in direct contact with copper include the following mediums: (1) horn or antler, (2) bone, (3) shell, (4) ivory, (5) wood, (6) rawhide or leather, (7) various vegetable hafting, bead cords and fish lines, as well as (8) leather and vegetable or textile bags, pouches and wrappings. Preserved organics

Fig. 7 *Two Copper Awls With Associated Organic Bone*

Fig. 8

Figures 7 and 8. Two distinct types of awls with somewhat different work tasks. Fig. 4 was recovered from along the Ohio River in Indiana. It is pictured on page 40 in The Red Skins Volume XIII 1978 Specialized Copper Issue - Published By The Genuine Indian Relic Society. Edited by John Baldwin. Fig. 5 is ...
Curated by Great Lakes Copper Research.

also add to our knowledge of how some implements (knives with handles, spears with shafts, toggle-headed harpoons with line, for example) were used. Preserved organics also hint at the work tasks expected for certain implements.

Our modern thimble is a small, hard pitted cup worn for protection on the finger that pushes the needle through fabric while sewing. But, copper awl (fig. 7) from along the Ohio River in Indiana (Baldwin 1978: 40 & 58) has a built in thimble-like bone base that can be gripped in the hand or pushed with the palm. Both of these work tasks obviously accommodated tougher sewing materials like bark or leather.

Figure 8 is another, smaller copper awl, but utilized with a bone handle preserved in part by copper salts contained within the copper awl and other copper objects found in the same cache. Both figures 7 and 8 are copper awls, not needles. Both were most likely used to create holes in materials, not to pull line (thread) through those holes.

Although both figures 7 and 8 possess similar work tasks, making holes in work materials, they differ in several ways. Fig. 4 is larger and longer with a bone thimble-like base. Fig. 5 is shorter and smaller with a large bone handle, one made for gripping and shoving (pushing).

Fig. 9 is an ornament, two copper loops joined by a third or middle loop and a shell link with two drilled holes. This object may be an earring.

Fig. 10 is a bone (perhaps a bird leg bone) with both ends broken and a length of thin sheet copper wrapped around its middle. Its utility is unknown. Fig. 12 consists of leather, textile and cordage preserved by organic salts. Fig. 11 consists of two pieces of copper tied together with cordage in repair or for storage and the cordage is preserved by copper salts. Fig. 12 (TN- 1700's) consists of leather, textile and cordage partially preserved by copper salts.

Copper Artifacts With Organic Bone Parts

Fig. 9
Copper chain links connected with a double drilled shell link

Fig. 10
A bone wrapped with thin copper - Purpose unknown

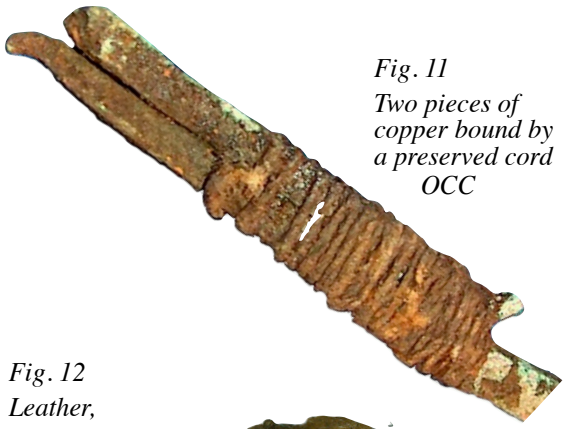


Fig. 11
Two pieces of copper bound by a preserved cord
OCC

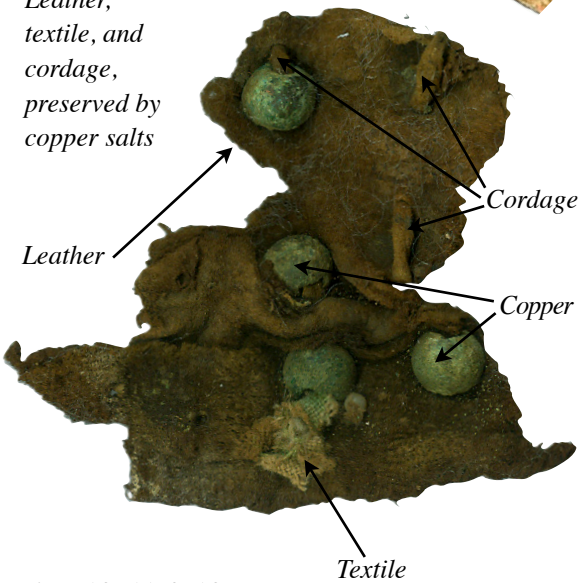


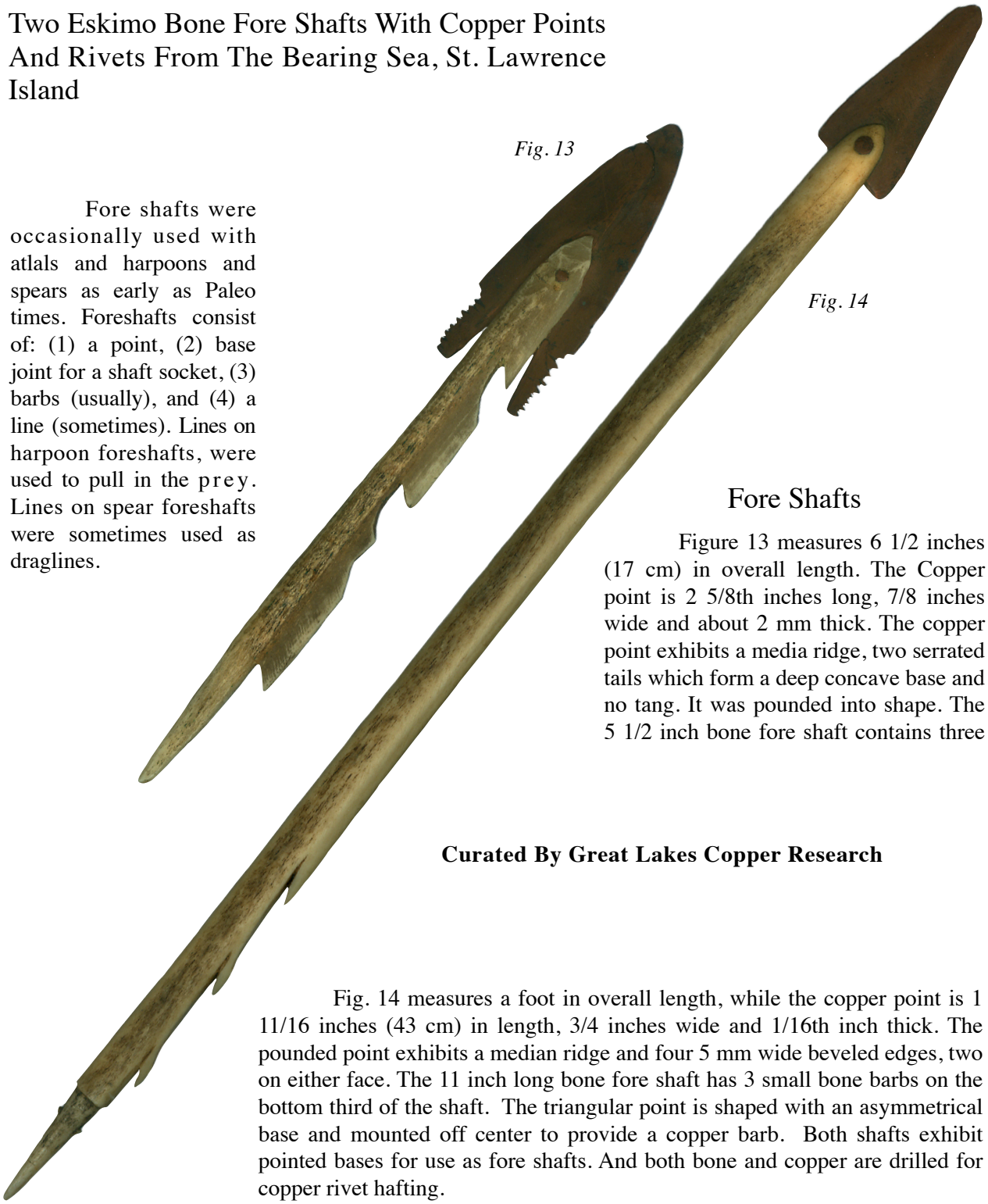
Fig. 12
Leather, textile, and cordage, preserved by copper salts

Figs. 10, 11 & 12
Curated By Great Lakes Copper Research

Two Eskimo Bone Fore Shafts With Copper Points And Rivets From The Bearing Sea, St. Lawrence Island

Fig. 13

Fig. 14



Fore shafts were occasionally used with atlals and harpoons and spears as early as Paleo times. Foreshafts consist of: (1) a point, (2) base joint for a shaft socket, (3) barbs (usually), and (4) a line (sometimes). Lines on harpoon foreshafts, were used to pull in the prey. Lines on spear foreshafts were sometimes used as draglines.

Fore Shafts

Figure 13 measures 6 1/2 inches (17 cm) in overall length. The Copper point is 2 5/8th inches long, 7/8 inches wide and about 2 mm thick. The copper point exhibits a media ridge, two serrated tails which form a deep concave base and no tang. It was pounded into shape. The 5 1/2 inch bone fore shaft contains three

Curated By Great Lakes Copper Research

Fig. 14 measures a foot in overall length, while the copper point is 1 11/16 inches (43 cm) in length, 3/4 inches wide and 1/16th inch thick. The pounded point exhibits a median ridge and four 5 mm wide beveled edges, two on either face. The 11 inch long bone fore shaft has 3 small bone barbs on the bottom third of the shaft. The triangular point is shaped with an asymmetrical base and mounted off center to provide a copper barb. Both shafts exhibit pointed bases for use as fore shafts. And both bone and copper are drilled for copper rivet hafting.

Beads With Organic Materials Preserved By Copper Salts

Fig. 15

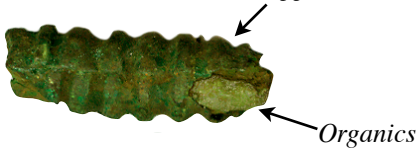


Fig. 15 is a large serrated bead-like object. The copper bead is composed of parallel serrations, 6 alternating higher rings divided by 5 lower channels. The length of this bead is 1 3/8" (35 mm), while its diameter is 7/16" (12 mm). It contains a fibrous core or thick cord roughly 9 mm in diameter which runs the length of the copper bead-like object. This specimen has a TN provenance.

Fig. 16

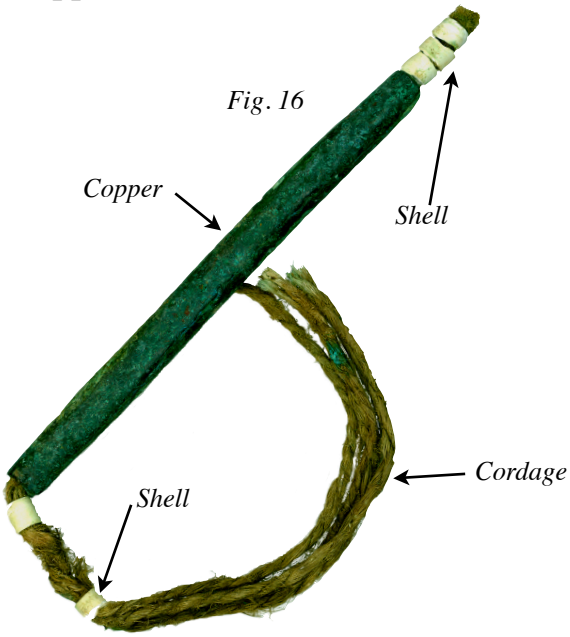


Fig. 16 consists of (1) a long 3 inch (75 mm) rolled bead, 1 quarter inch (6 mm) in diameter, (2) 5 shell beads and a long twisted vegetable cordage. It has a Washington State provenance and attributed to the 1600's.

Rolled Copper Bead With Vegetable Cordage

Fig. 17

Fig. 18

Fig. 19

Fig. 20

Fig. 21

Fig. 22

Fig. 23

Fig. 24

Rolled Copper Bead With Leather Cordage

Figs. 17-22 are rolled copper beads with vegetable strings. Figs 23 & 24 have leather cordage. These specimens were recovered by James Cheyne near the Columbia River, Washington, in 1933.

Single Middle Tang Crescent Knife With Preserved Textile
The Dry Desert Is another Form Of Preservation

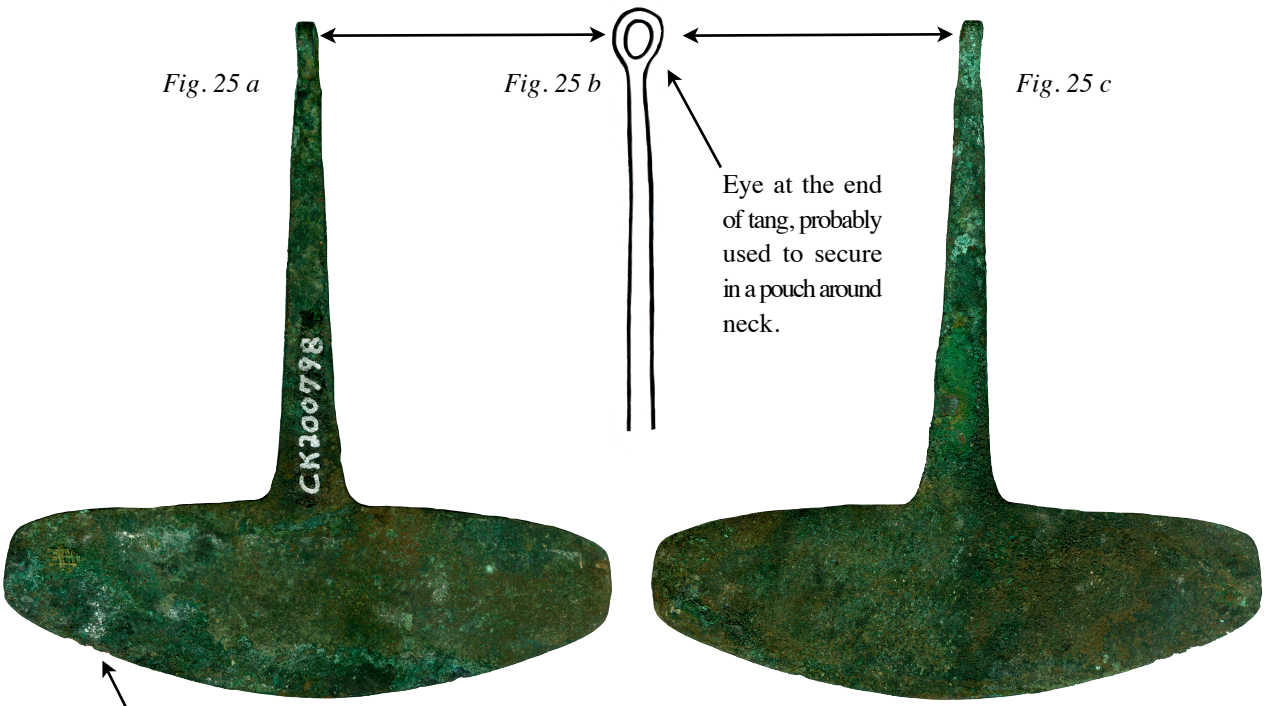


Fig. 25 a
A blow up of textile preserved on the face of a crescent knife blade. Textile is probably the remains of a wrapping or from textile in grave where specimen was offered. The textile was preserved by copper salts and the dry Atacama Desert. Provenance: Moche, Peru (100 - 800 AD).

Desert Preservation

A dry desert environment, especially one as dry as the Atacama Desert (a strip of land along the Pacific Coast, west of the Andes and the driest hot desert in the world), preserves organic material even better than do copper salts. Organic material is dehydrated and preserved forever.

Fig. 26
Copper effigy in cotton Swaddling preserved in part by copper salts, but mainly by the dry Atacama Desert.
Moche Culture

Crescent Knife Curated by Great Lakes Copper Research

Buffalo Rib Bone Handles With Inserted Copper Blades
Mandan Indian Culture

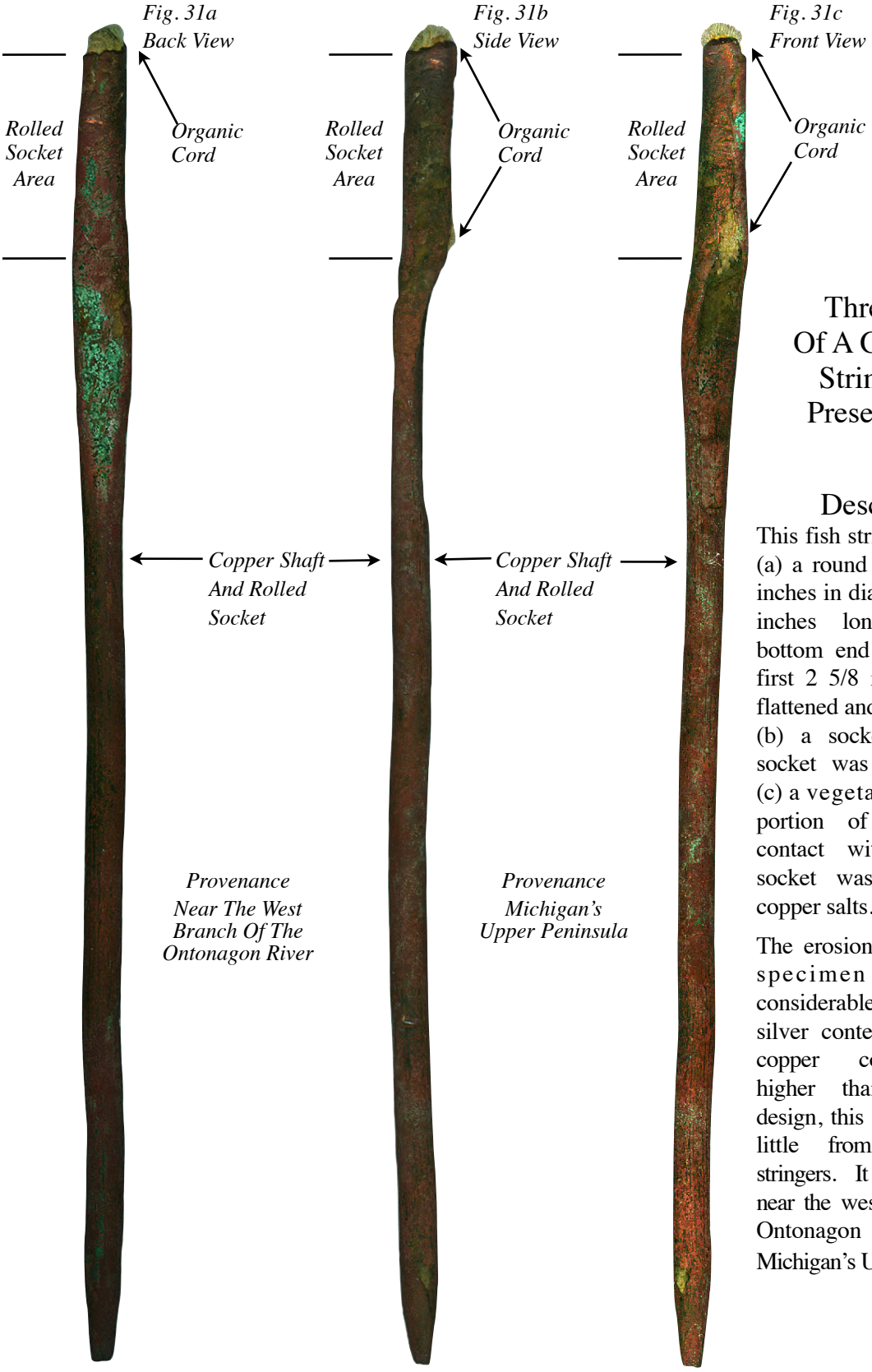
Fig. 27

Fig. 28

Fig. 29

Fig. 30

Curated By Great Lakes Copper Research



Three Views Of A Copper Fish Stringer With Preserved Cord

Description

This fish stringer consists of (a) a round copper rod, 1/4 inches in diameter and 8 1/2 inches long. While the bottom end is pointed, the first 2 5/8 inches was first flattened and then rolled into (b) a socket. Finally, the socket was tightened over (c) a vegetable cord. That portion of the cord in contact with the copper socket was preserved by copper salts.

The erosion pattern on this specimen indicates considerable age while the silver content of its native copper construction is higher than normal. In design, this specimen differs little from modern fish stringers. It was recovered near the west branch of the Ontonagon River in Michigan's Upper peninsula.

Curated By Great Lakes Copper Research

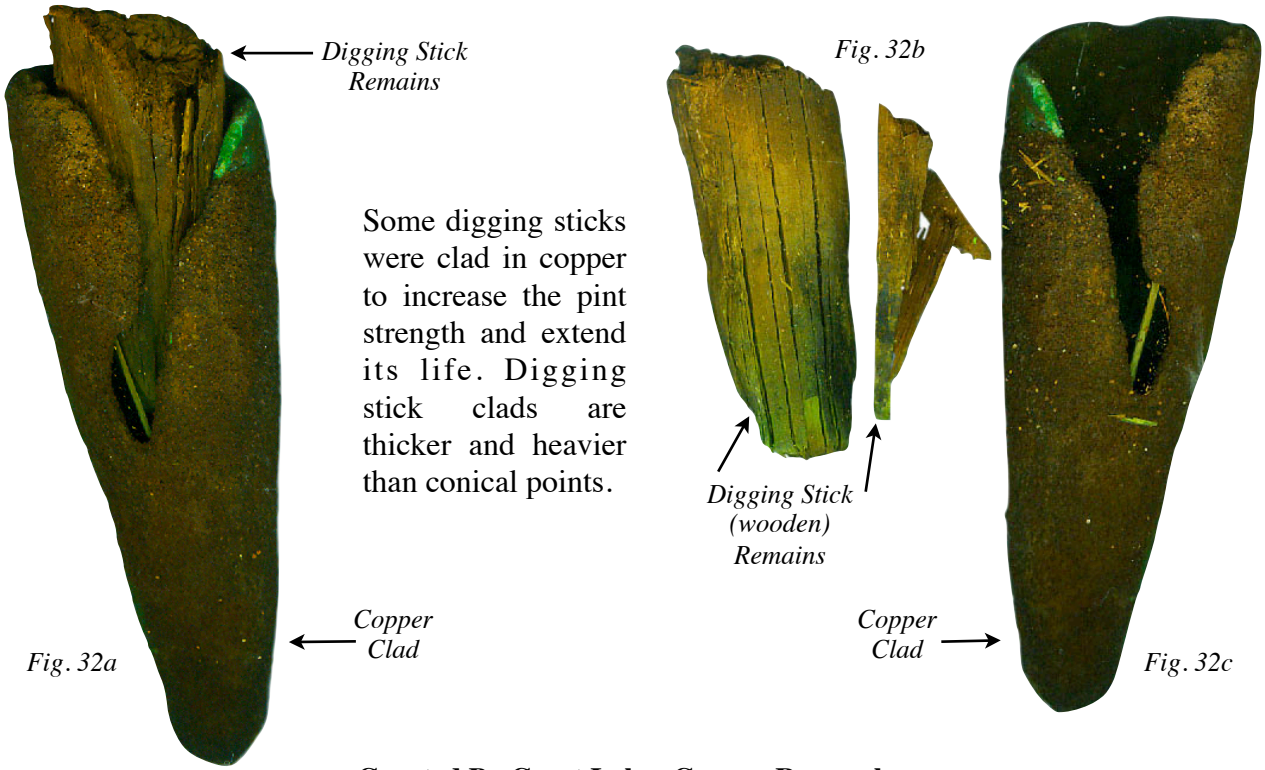
Conical With Wooden Shaft

Conicals and awl-like objects were probably among the first copper implements crafted in the Great Lakes Area. Both Conicals and awl-like objects were probably used for many work tasks. These copper implements were most likely used by nearly all copper using cultures from Late Archaic times until modern times (20th Century).

Conicals were formed from rolled triangular shaped sheet copper preforms and blanks of various thicknesses. Often much of the point area consisted of heavier solid copper than did the socket area. All conicals are cone shaped objects or triangular sockets. A few sockets are nearly closed but most are open to various degrees. Variations of conicals include: thickness of copper, percent of conical length used as a socket, the degree of socket enclosure, overall length of the conical, and the shape of a conical's point.

Conical point shapes are determined by the work tasks conicals were designed and created to perform. To a lesser degree the same is true of the size, shape and openness of the socket, the thickness of the copper and the conical's overall length. Implements and work tasks for conicals may include: Spear points, arrow heads, atlatl points, harpoon heads, digging stick clads, knapping hammers, pick-like tools, adzes, ice spuds, drills, awls, reamers, and tinkle cones. Conicals were probably used as tools, weapons, musical implements and ornaments and more.

Conical – Digging Stick Clad With Wooden Shaft Remains



Curated By Great Lakes Copper Research

More Copper Knife Blades With Organic Handles

Collection Curated by Great Lakes Copper

Fig. 13 North West Coast

Fig. 14 OCC WI

Fig. 15 Alaskan Eskimo

Fig. 16 OCC MI

Fig. 17 Alaskan Eskimo

Fig. 18 OCC MI

Fig. 19 St. Lawrence Island

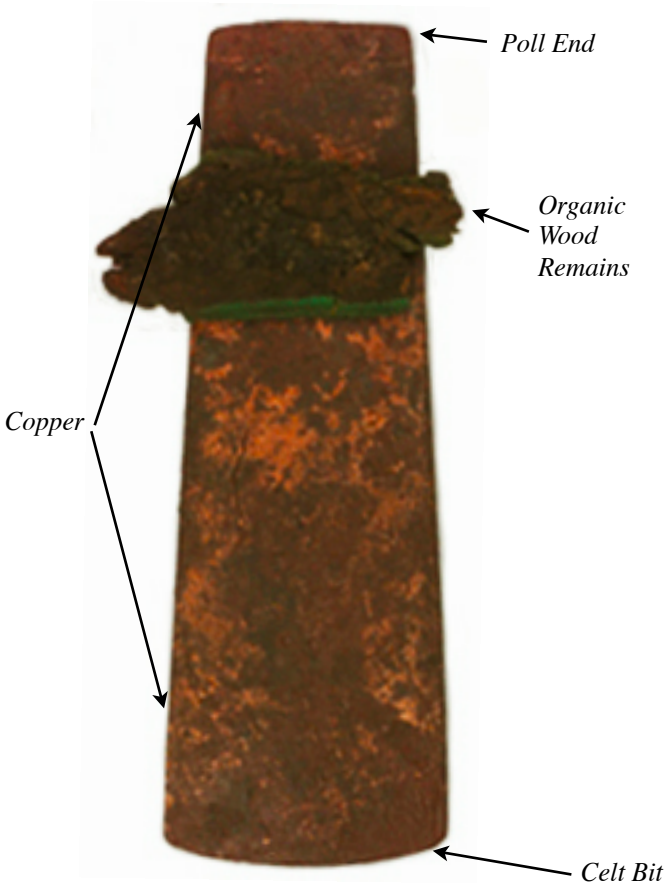
Fig. 20 OCC

Fig. 21 OCC

Although the 9 copper blades in this collection (together with their organic handles) are authentic, these specimens have no archaeologically history and we cannot, therefore, know when copper blades and organic handles were joined.

Late Mississippian Celt Type Axe With Organic Remains Of Wooden Handle

Fig. 22



Culture/People:
probably Late Mississippian Tradition (archaeological culture) (attributed)

Object name:
Axe with fragment of wooden handle

Date created:
AD 1300-1500

Place:
Near Moundville; Black Warrior River Mound; Hale County; Alabama; USA

Media/Materials:
Copper, wood

Techniques:
Hammered

Collection History/Provenance:
Excavated by Clarence B. Moore in 1905; donated to the Academy of Natural Sciences (Philadelphia) soon afterward; purchased by MAI as part of the C.B. Moore collection in 1929.

Dimensions:
13.90 x 4.90 x 7.00 cm

Catalog number:
17/193

Curated By The Smithsonian National Museum Of The American Indian

Conclusions

Copper is unique among mediums used to create prehistoric American Indian artifacts. Some fungi are heterotrophic organisms, decomposers using a biochemical reaction to break down and feed upon dead matter. Nearly all organic matter is subject to destruction by fungi and thus most organic artifacts are lost to history. Copper, however, uniquely contains natural chemical compounds that act as fungicides, killing the biological chemical compound, fungi. Organic materials in direct contact with copper are, thus, often partially preserved.

The greatest value of prehistoric organic materials preserved by copper salts is for radiocarbon testing and dating. Nearly all museum and private prehistoric copper artifact collections contain some preserved organic materials which might be tested and dated. We recommend that these collections of prehistoric copper artifacts be examined for organic remains and tested by graduate students conducting research for Masters and Doctoral Degrees.

The Human Hand As An Anthropomorphic Copper Effigy

Introduction

Primitive peoples around the world, from Australia to the Americas, have bestowed us with drawings and effigies of human hands. Some rare North American cultures, especially a few in and around the Great Lakes area, have donated copper effigy hands for us to ponder. We cannot say for sure what these copper hands, or hands created from other mediums, symbolized to those who created them. No doubt there were similarities as well as differences in how copper hands were perceived from culture to culture. We do know that the hand served as a powerful symbol in many primitive cultures. In this first thesis on the symbolism of hands, we will simply illustrate a few copper hand effigies and reflect on our present day associations with hands.

Fig. 1

Fig. 01
Copper Hand (Fig. 01) exhibits two punched holes, probably for attachment to a costume for wearing in a ceremony. This specimen is one of a pair, see Fig. 02 and is attributed to the Hopewell Culture?

Physically, hands are used to climb up, dig down and swim away. And hands are symbols of salutations, condemnation, supplication, prayer, surrender, and defense. We can raise our hand against another, give them the back of the hand or shake another's hand. The deaf talk (sign) with hands, while the blind see (feel) with hands.

Hands are domestic utilities, weapons of war, fingerprints of individuals and instruments for building sophisticated societies. Hands not only kill enemies, but they create music and art, heal the sick, caress with love and reach for heaven. If eyes are windows to the soul, hands are tools of the heart, implements of the mind.

Fig. 2

Fig. 02
A second Hopewell (?) copper hand with 3 holes punched in the wrist. 400 BC to 500 AD?

Hands are associated with work: the helping hand, the guiding hand, the hired hand, give me a hand, handy hands, the handyman, a dab hand and all hands on deck. We also have diligent hands, busy hands, idle hands, lazy hands, a slack hand, and the man with two right hands. If we want support, we ask for a show of hands. We may know someone, firsthand, who is heavy handed. We may win hands down. Others are underhanded. We may force someone's hand, gain the upper hand, play into someone's hands, or find one with blood on his hands. We can wash our hands of a responsibility. There's the hand of man or the hand of God. And which do these copper specimens represent?

Hands are also associated with making a living: One who disdains work hates to dirty his hands, to live hand to mouth, to scratch out a living, exhaust resources hand over fist, surrendering by throwing one's hands up or win hands down. We hand something out to the poor, hand something on to another, or if forced, we can hand something over. In giving to the poor, we hope they won't bite the hand that feeds them. If we tire of something, it becomes old hand. On the other hand, we place something of value in safe hands and those who cooperate go hand in glove or one hand washes the other.

Hands may represent opposites, a weak left and the strong right, for example. Hands might also symbolize good and evil, peace and war, rain in due time or drought and famine or times of plenty, young and old, male and female, love and hate, life and death.

Hands, with their opposing thumb are sometimes used to distinguish humanity as distinctly different from animal life. Perhaps nothing symbolizes man so much as his hands. And little exists that man understands so well as his own hands, yet in some ways hands, especially effigies of hands, remain something of an enigma.

Copper Hand
Curated By Great Lakes Copper Research

Fig. 3

Fig. 4

Ex Erskine Carter Collection
Provenance: Early County Georgia – Attributed to early Fur Trade Era.

A Taxonomic Classification Of The Conical Toggle Head Type Harpoon

American Indians may have used Copper in the Great Lakes Area as early or earlier than any place else in the world (Steinbring 1990: 57). Conicals were, perhaps, one of the first implements to be formed from copper and conicals of one kind or another continued in use during the Fur Trade Era and beyond. Some of the most primitive tools are conical harpoon points. And conical harpoons were recovered archaeologically at Oconto 7500 - 900 BP, Osceola 4080 - 3450 BP, Reigh 3660 BP, Riverside 3040 - 1949 PB (Pleger 2009: 699), and Morrison-6 4750 BP (Mason 1981: 195) among others. Our research is based on an analysis of 210 conicals.

Copper conicals were used for a wide range of work tasks. Projectile heads were among the most common utilities. And harpoon points include the most frequently recovered copper projectile point heads. We have identified at least four conical point traits, which we hypothesize distinguish conicals employed as harpoons from similar conical points used for other utilities.

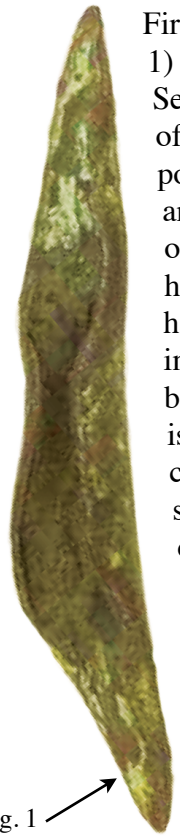


Fig. 1
A conical point with a base-barb

First, a barbed socket base. Fig. 1) is diagnostic of harpoon use. Second, a line hole in the side of the socket (Fig. 2 & 3) may point to an entrance for a line and lines are an integral part of every toggle-headed harpoon. Some specimens have both a punched line hole in the side of the socket and a base-barb (Fig. 3). A third trait is a pointless or open-point conical tip (Fig 4). All or a substantial portions of conicals consist of hollow sockets open at the base and perhaps showing an open-face. Some few, however, have an open point-tip end, as if the point-tip was sawed away (Figs. 27-39). All Toggle-Headed Harpoons have removable spear shafts. In open-point conical specimens, the wooden shaft extends all the way through the conical. And it is the wooden shaft point that served as the harpoon point-tip. (figs 1 & 4, 26-39).

Fig. 2
A conical point with a holes, and no barbs

Finally, we have conical specimens with a notch which may have served as a line attachment (Fig. 4 & 26-39). In theory, we might find barbless and hole-less copper conicals with additional or different kinds of line attachments. These include a grove around the point, or even a knob around which lines were fastened. But to date, few such examples of line attachments have been identified on copper conicals used as Toggle-Head Harpoons. Grooves and other such examples are, however, fairly common on other types or non conical Toggle-Headed harpoons.

It is more difficult to assign toggle-head work tasks to specific conicals with intact point-tips that do not exhibit barbs, holes, nicks, grooves or open point-tips (Fig. 5). But we suspect that some barbless, hole-less conicals with intact point-tips and

Toggle-Head Harpoon With Hole-Fastener And Base-Barb Traits

Fig. 3
A conical point with two Toggle-Head Harpoon traits, a hole for line and a base tang.

Fig. 3
A specimen curated by the Smithsonian Museum

no groves or notches were used as harpoons, but not necessarily as Toggle-Headed harpoons.

At least two distinct types of copper conical harpoons exist. These are: (1) harpoon heads fixed permanently to long staffs and (2) copper Toggle-Headed Conical Harpoons loosened from their staffs upon impact (target penetration). Targets consist primarily of fish, but also include many other water prey. In addition, non-conical harpoons all follow the same patterns, i.e., those fastened permanently to long staffs for throwing or jabbing and detachable toggle-headed or fore-shafted harpoons. Detachable harpoons are further divided into Toggle-Headed Harpoons and those with detachable fore-shafts. Fore-shafted harpoons do not necessarily possess lines, but Toggle-Headed Harpoons always use lines.

Most, if not all prehistoric American Indian village sites, were located near water. Site excavations and especially studies of refuse pits lead us to believe fish and other water animals susceptible to retrieval by harpoon were a common stable in nearly all Indian diets. Being a common and necessary tool, it is not surprising that harpoons are so varied and common. We hypothesize that commonality (so many recovered) and versatility (so many varieties) were necessary to satisfy (a) prolific use and (b) assorted requirements caused by diverse prey.

The Harpoon Genre is one of several genres making up the Projectile Division. The Harpoon Genre is further broken into several Type classes. In this essay, we will survey one taxonomic Type, Toggle-Headed Conical Harpoon and some of its varieties (n = 210).

A Toggle-Headed Harpoon is defined as consisting of three parts, (1) a detachable head, usually with a barbed socket base and a place to secure a line, (2) A long detachable shaft and (3) a line. Some lines were fastened to a tiny toggle rod, which was inserted into a hole on the side of copper conical sockets (Figs. 2, 3 & 25). Others were attached by means of holes, nicks, grooves, swellings on tangs, etc.

Fig. 4
A conical point (Toggle-Head Harpoon) with two Toggle Harpoon traits, a line notch and missing point-tip.

A fisherman using a Toggle-Headed Harpoon threw the harpoon at his prey or jabbed at the prey with the harpoon still in his hands. As the harpoon head penetrated its prey, the fisherman dropped the long shaft in his boat or if fishing on

shore, he threw it aside for easy retrieval. This left the harpoon head attached to a line inside the prey. As the fisherman pulled on the line the harpoon head turned sideways preventing it from slipping out of its entrance hole. The base-barb balanced with the opposite or point-end of the harpoon head. The line was fastened someplace between to balance the harpoon head, stretched tightly across the hole. And all the fisherman had to do was pull his prey to him.

Fig. 5
A conical point specimen with none of the exterior traits, punched holes, base-barbs, missing point-tips and notches or groves. But it has a socket and a piercing point-tip, integral harpoon traits also found on many other conical implements. Because these conical points are often found at water sites together with other fishing implements, we suspect some may also have served as harpoon heads.

Occasionally we run across Toggle-Head Harpoons with unusual traits or line fastening traits One ancient coppersmith experimented with a two hole line attachment (Fig. 6). Additionally it exhibits a base-barb.

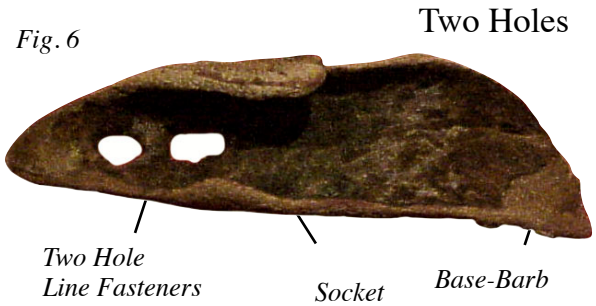
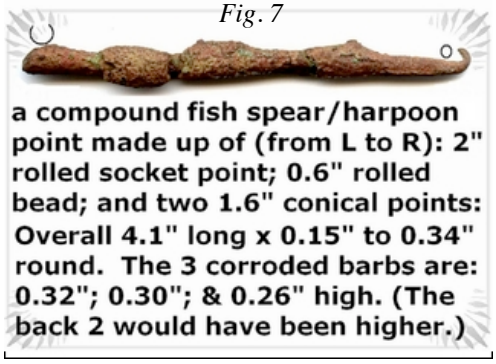
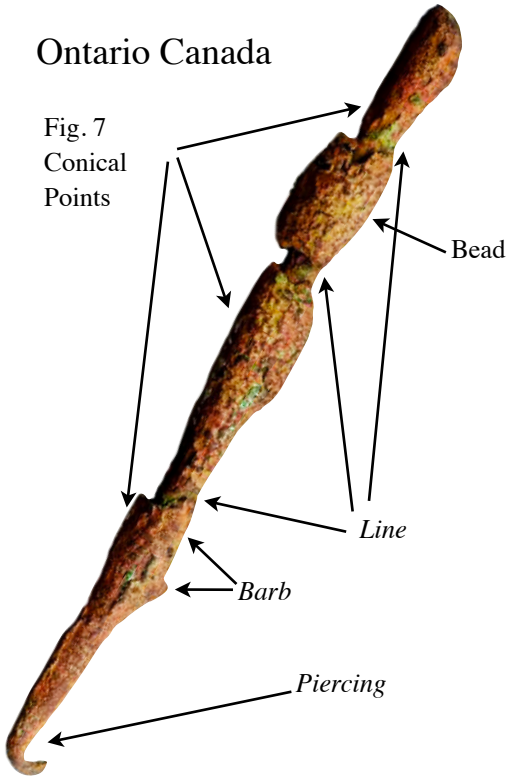


Fig. 6

Fig. 7



Occasionally our ancient past throws up a real one of a kind specimen for us to wonder at and admire. Fig. 7 is curated by Oliver N. Anttila. He believes it is a fish spear (harpoon). As its components include conical points, it qualifies for the taxonomic class, Conical Harpoon. As this unusual specimen possesses sockets barbs and multiple line ties, it falls into the sub taxonomic class, Toggle-Head Harpoon, Conical Variety.



A Sample Taxonomic Classification, One Variety of One Type
Copper Conical Toggle-Headed Harpoon

Fig. 8 *Fig. 9* *Fig. 10* *Fig. 11* *Fig. 12* *Fig. 13* *Fig. 14* *Fig. 15* *Fig. 16* *Fig. 17* *Fig. 18*

Fig. 19

Open-Tip or missing a piercing Point-Tip

Figs. 8-19

Kingdom:	Metal
Family:	Copper
Kind:	Tool
Division:	Projectile Points
Genre:	Harpoon
Type:	Conical Toggle-Head
Variety:	Base-Barbed Open-Tip

We have classified figures 8-19 as Conical Toggle-Head Type, Base-Barb, Open-Tip Variety. But for their Open-Tip trait, we might just as easily have classified them as Conical Harpoon Type, Base-Barbed Variety. The base-barb trait shared by figs. 8-19 are a common traits found on both types, non Conical Toggle-Head Harpoons and Conical Toggle-Head Harpoons. Our study is limited to the Conical Toggle-Head Harpoons. The fact that several of these specimens, figs. 9-14, 16 & 17 have Open-Tip traits lead us to classify them as Toggle-Heads.

A characteristic of the Toggle-Head Open-Tip Conical Harpoon is that its shaft stretches through the socket and protrudes out of the open-tip and forms the harpoon's point-tip (See line drawings, Figs 20 & 21). The penetrating point-tip is, therefore, wooden. The vast majority of copper harpoon's penetrating point-tips are copper, formed as a solid extension beyond the socket or tang-head. In other words, the wooden shaft on permanently fixed harpoon heads is clad in copper and the copper Point-Tip is, therefore, solid, thick and sturdy copper.

In throwing harpoons and occasionally jabbing with harpoons, fishermen had two options, wooden or copper point-tips. And point-tips, wooden or copper, were destined to hit or miss their target. Those striking their prey experienced a soft landing, but missing their mark, harpoon point-tips might strike a stoney bottom or collide with bigger rocks. Some point-tips might even struck boulders. Missing their target and hitting a hard surface, some copper point-tips were blunted, others bent, but a number broke. Blunted copper tips might be sharpened, bent ones straightened and some broken ones were reworked, while some percent of the broken point-tips were taken out of service.

Wooden shaft tips suffering identical impacts were far more likely to break or split. If the broken (wooden) shaft tip harpoon happened to be in a Toggle-Head, all that was necessary was a quick removal and resharpening to create a new point-tip on a slightly shorter staff. But if, on the other hand, the fisherman used a Fixed-Head harpoon, he must disentangle the hafting, break lose the head, rework the point-tip, re-glue the harpoon point to its staff, create new rawhide or fibers to bind the head to the shaft and wait for the glue to dry.

Based on the probable number of tasks involved, the raw materials required and the amount time necessary to resume fishing, we hypothesize that open-tip conicals were used as Toggle-Head Harpoons, not as Fixed Head Harpoons. And fixed head conical harpoons were copper clad with copper point-tips. Therefore, we use the open-tip trait found on so many copper conicals as diagnostic of toggle-head use.

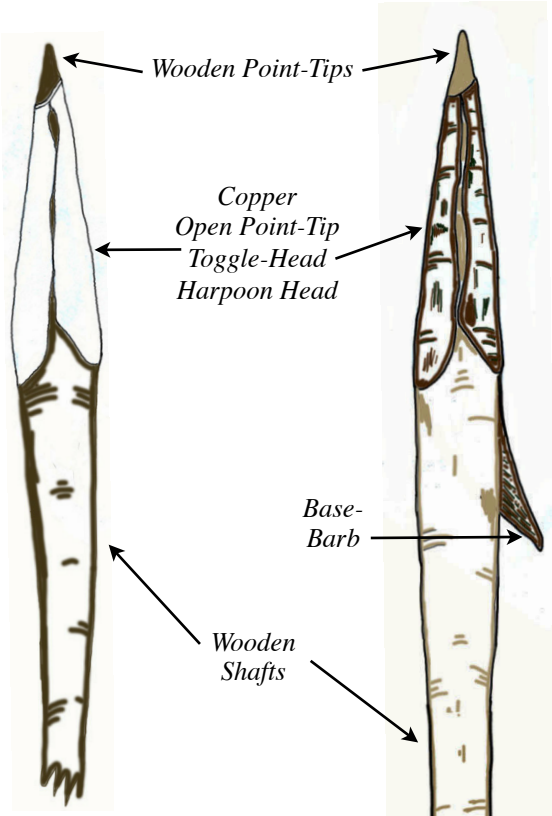


Fig. 20

Fig. 21

Line Attachment Harness

Fig. 22a
Conical Toggle-Head Open-Tip

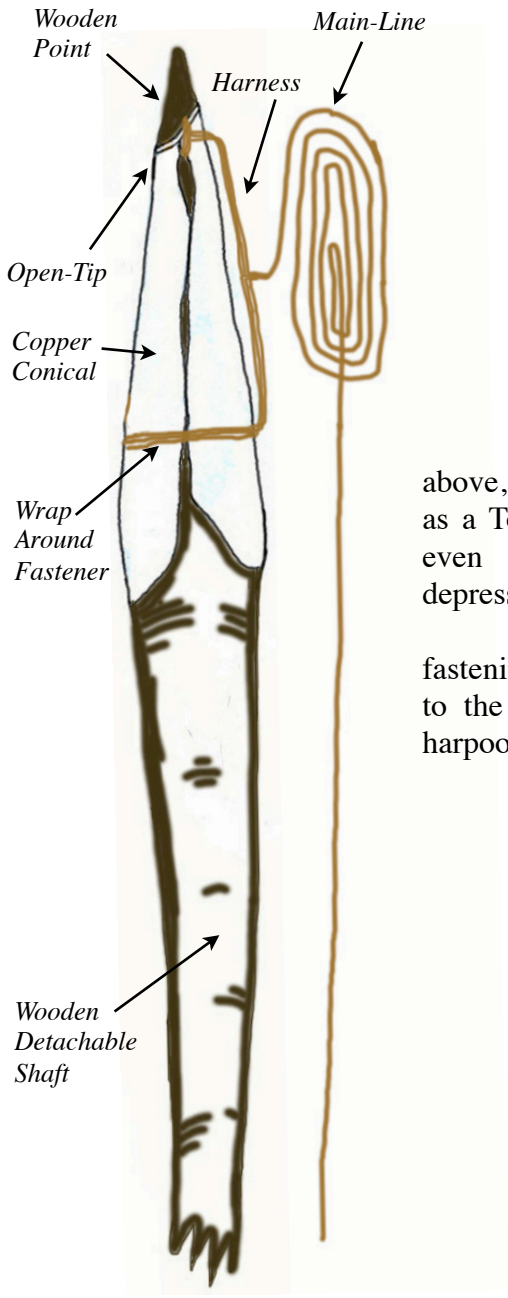


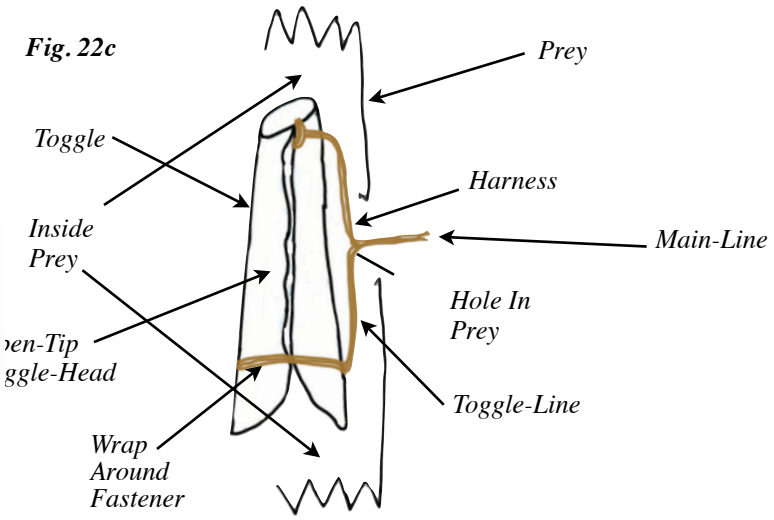
Fig. 22b

Kingdom:	Metal
Family:	Copper
Kind:	Tool
Division:	Projectile Points
Genre:	Harpoon
Type:	Conical Toggle-Head
Variety:	Open-Tip
	Wrap Around

We hypothesize that for the logical reasons mentioned above, an open-tip trait found on conicals is diagnostic of use as a Toggle-Head Harpoon Type. We believe this to be true even if conicals show no barbs, line hole, fasteners, depressions, swellings, nicks, grooves, etc. for line fastening.

We further theorize that in the absence of obvious line fastening traits, a harness was employed to (a) fasten the line to the harpoon head and (b) to convert the whole copper harpoon head into a toggle inside its prey. See Figs. 22-24.

Fig. 22c



Line Attachment Harness

We define a single line attachment as a Simple Line Attachment, the kind usually deployed on non conical Toggle-Head Harpoons. We hypothesize that two line were sometimes attached, one each from separate locations on the harpoon head. These two lines, together with the main-line were probably coupled together with the main-line as a Harness. A Toggle-Headed Harpoon harness is, therefore, two lines fastened to the harpoon head at two locations and then joined by a Toggle-Line to the Main- Line.

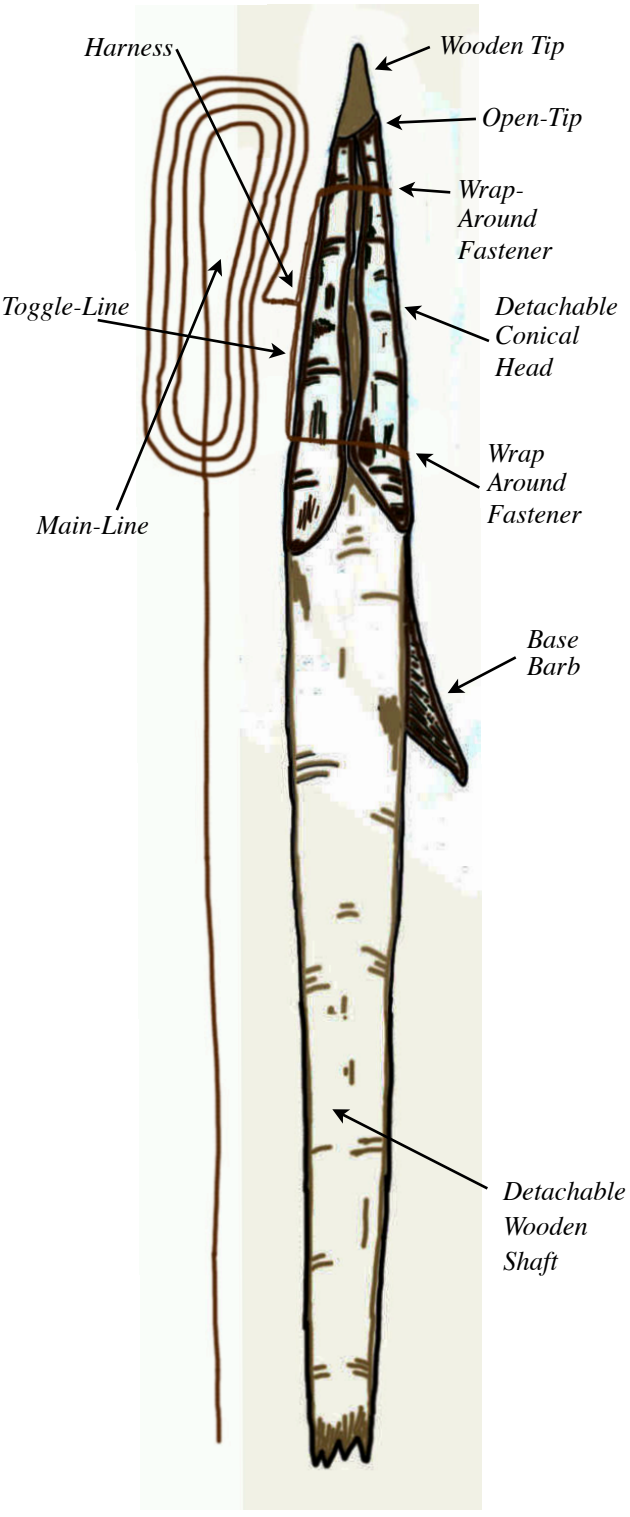
Fig. 23

Kingdom:	Metal
Family:	Copper
Kind:	Tool
Division:	Projectile Points
Genre:	Harpoon
Type:	Conical Toggle-Head
Variety:	Open-Tip – Base-Barb

To employ a harnessed harpoon head as a toggle inside the prey, the two lines must be (a) attached somewhere near opposite ends of the harpoon head and (b) coupled near the middle of the two attachments. See Figs. 22-24. The attachments may consist of simple Wrap Arounds or any other two forms of line attachments.

The line between the two attachments is called a Toggle-Line. The main-line is attached to the middle of the Toggle-Line. Once the harpoon head enters its prey, pulling on the harness by the fisherman or by

Fig. 23
Conical Toggle-Head Open-Tip



Line Attachment Harness

Fig. 24
Conical Toggle-Head -Hole Fastener

the prey converts the whole harpoon head into a toggle inside the prey. The toggle lies across the entrance hole preventing it from slipping out. See Fig. 22, 23 & 24.

Toggle-Lines serve another very practical purpose. The toggle-line, stretching between the two wrap-around line fasteners prevents wrap-around line fasteners from slipping off either end of the conical. The same toggle-line, stretched between one wrap around and a hole fastener or any other fastener trait serves the same purpose.

Fig. 24

Kingdom:	Metal
Family:	Copper
Kind:	Tool
Division:	Projectile Points
Genre:	Harpoon
Type:	Conical Toggle-Head
Variety:	Punched Hole Fastener
	Wrap Around

The reason so many conicals are found at water sites may well be due to the fact that Open-Point Conicals used as Toggle-Head Harpoons possessed so many advantages in fishing. Compared to other mediums, copper was fairly rare and expensive, even for copper culture people with access to copper. Copper must be sought out and mined, or traded for and perhaps transported for many days, weeks or months. And it was sometimes lost, stolen or pillaged.

Stone, vegetable fibers, animal parts, and wood, for example, were all easier to acquire. As copper was rare and expensive, compared to other mediums,

Simple Line Attachment

common wooden shafts that protruded all the way through conicals and served as wooden piercing points might be very attractive alternatives for copper piercing points. Conicals added weight to the end of the wooden staff. They wrapped around the staffs and held the line or harness in position. Finally, once detached inside their prey, they served as great toggles securing prey that might otherwise struggle free.

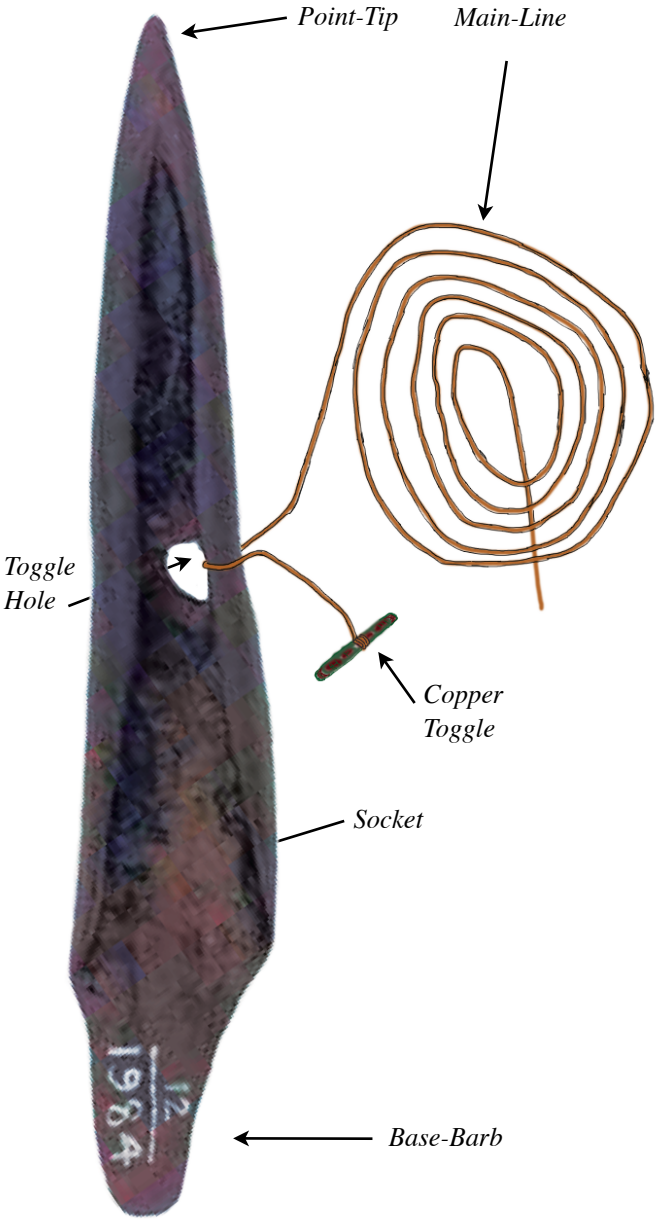
If our hypotheses are correct, this specimen, Fig. 25, and others of the same type employed two toggle techniques. First the rod at the end of the line served as a toggle to hold the line inside the harpoon head socket. Second, because the line fastening hole was punched into the copper midway between the harpoon extremities, Point-Tip and Base-Barb, the whole harpoon head served as a toggle inside the prey.

Pulling on the line by the fisherman or by the prey turned the length of the harpoon head sideways inside the prey and prevented it from exiting the entrance hole. However a simple line does not do this as well as does a harness with a Toggle-Line. See Figs. 22, 23 & 24.

Fig. 25

Kingdom:	Metal
Family:	Copper
Kind:	Tool
Division:	Projectile Points
Genre:	Harpoon
Type:	Conical Toggle-Head:
Variety:	Hole Fastener, Base-Barb

Fig 25
C*onical Toggle-Head Harpoon Type*
Base-Barb - Hole Fastener Variety



Most harpoon types were probably used for jabbing. And wooden staffs remained in the fisherman's hands during jabbing. After piercing the target, toggle-head staffs were simply tossed aside for easy retrieval. But if harpoons were thrown, fisherman encountered a staff recovery dilemma. Retrieval in shallow streams and lake shores posed little problem, but long casts, deep water throws and hurls at large prey, all exposed harpoon shafts to possible loss, especially if the thrower missed his mark.

Prehistoric fishing involved harvesting deep water prey from lakes and streams. And modern day recoveries of all copper harpoon-heads types and varieties from what was once deep water sites prove: (1) that many harpoon-heads and harpoon-staffs were lost in the water after missing their target, or (2) carried away by big prey. But neither wooden staffs nor copper heads were considered expendable by their owners. And efforts were surely devised to recover long wooden shafts, especially those fitted with valuable fixed copper heads.

One method of retrieval for both toggle-head and fixed-head harpoon staffs may have involved the same technology used for recovering toggle-harpoon heads, i.e., toggle-lines (see Fig. 24b). Another method may have employed air bladders attached to wooden staffs by extended lines (see Fig. 24c). Organic recovery-paraphernalia, if such existed, have long ago decomposed or if recovered, they go unrecognized.

Yet today, we recover all the types and varieties of copper harpoon-heads from prehistoric deep water sites. Based on this fact and their obvious value to prehistoric fisherman, we theorize that multiple recovery technologies were anciently devised and employed to prevent harpoon staff loss. However successful these recovery technologies, modern reclamations of ancient copper harpoon-heads prove that during copper's reign, 7-9 millennia, ancient recovery technology occasionally failed.

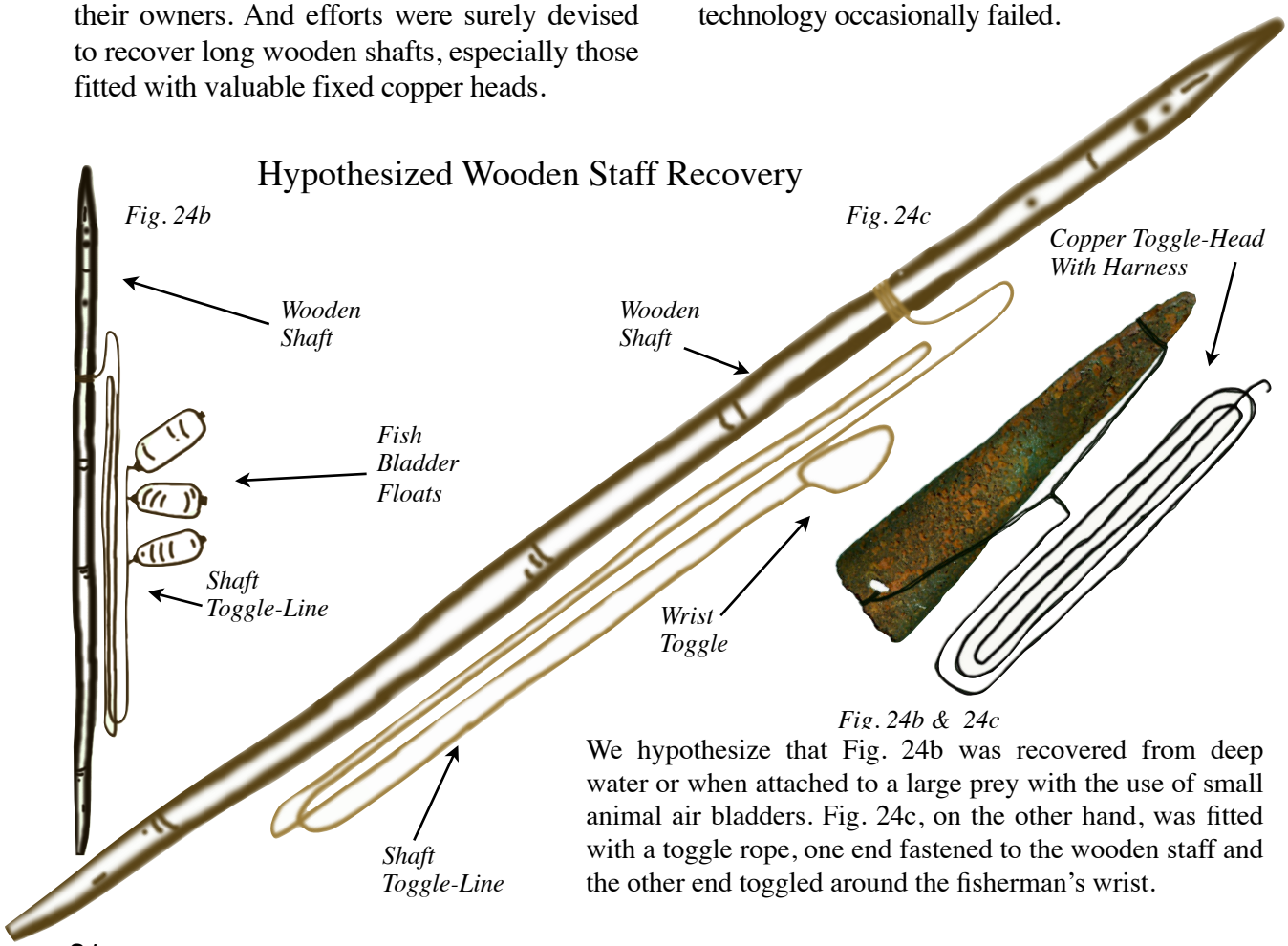


Fig. 24b & 24c

We hypothesize that Fig. 24b was recovered from deep water or when attached to a large prey with the use of small animal air bladders. Fig. 24c, on the other hand, was fitted with a toggle rope, one end fastened to the wooden staff and the other end toggled around the fisherman's wrist.

More Examples Of Copper Conicals With Open-Tip Traits

Curated By Great Lakes Copper Research

A wide variety of Open-Tip Conical Points from various geographic locations spread over a period of several thousand years. Most of the above specimens are probably Toggle Head Harpoon heads, while some are tinkle cones. And conicals were used for many other work tasks.

Conical Toggle-Head Taxonomic Classification

Kingdom: Metal
Family: Copper
Kind: Tool
Division: Projectile Points
Genre: Harpoon
Type: Conical Toggle-Headed
Varieties: Open-Tip – Base-Barb – Open-Face – Hole Fastener – Wrap Around – Hole Fastener

Open-Faced Conicals

Figs. 40-43

Curated By Great Lakes Copper Research

Figs. 40 & 42 exhibit base barbs and are thus toggle Head Harpoon candidates.
Figs. 41 is an Open-Faced Conicals and exhibits no sure harpoon traits.
Fig 43, however, has a pinched waist and so it could be easily used as a Toggle Head Harpoon.

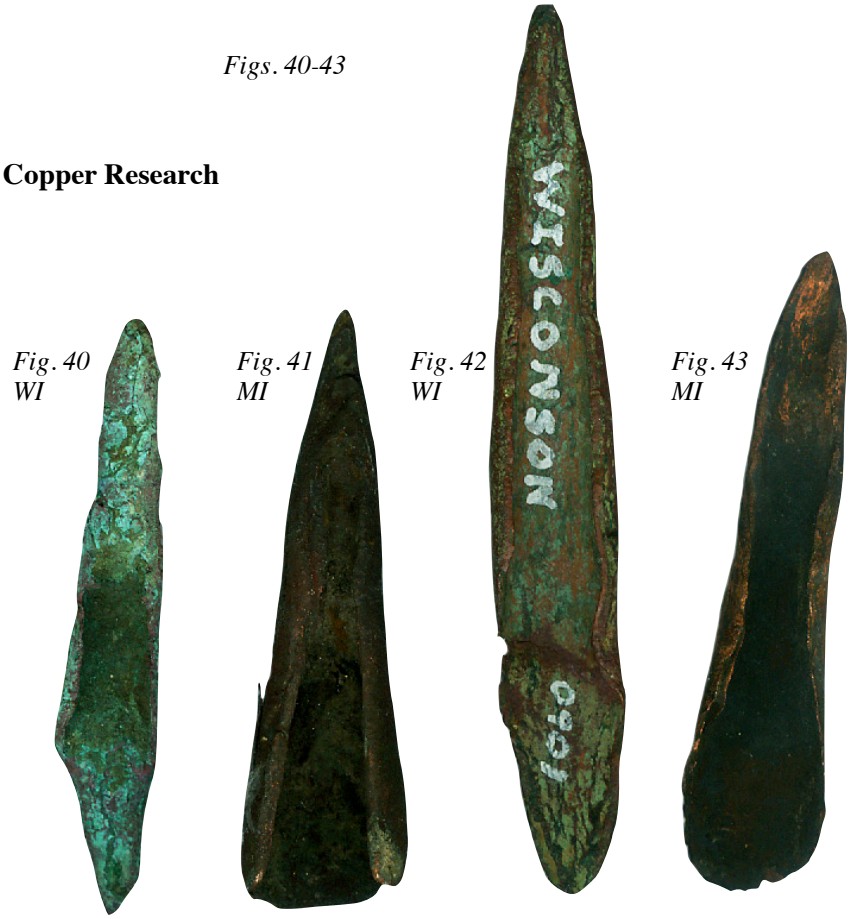


Fig. 40 *WI*
Fig. 41 *MI*
Fig. 42 *WI*
Fig. 43 *MI*

Inventory (210) Of Research Conicals n = 210

Open-Tip	Base Barb	Hole	Two Hole	Open-Tip Hole	Base Barb Hole	Base Barb Open Tip	Two or More Traits	Non Harpoon
21	17	6	1	7	6	15	20	160

Total With Harpoon Traits + 73 Of The 73, 20 Had Two Or More Harpoon Traits

Conclusions

Toggle-lines tethered targets and dragged in prey. Therefore, in the exercise of harpoon tasks, the toggle-head was often superior to the fixed-head harpoons. Missing the mark with a fixed harpoon head ran a risk of loosing the gear; while pulling in the line retrieved toggle-heads. Similarly, prey sometimes threw off fixed headed harpoon in deep water, but lines easily recovered toggle-heads. Thus, toggle-heads could be more safely thrown further from shore or boat, in deeper depths and in icy water.

In addition, as afore mentioned, Open-Tip Conical Toggle-Heads used detachable copper points, open head tips and wooden staffs that extended all the way through the copper socket to form a wooden point-tip. This made reworking damaged wooden points tips extending through copper harpoon heads quick, easy and economical, whereas it was necessary to replace fixed copper heads, a difficult, costly and time consuming process.

Because of the toggle-head advantages, toggle-head copper harpoons are recovered in great variety and abundance. Because of wrap-around line fasteners and other not-so-obvious line fasteners, many toggle-head harpoons go unrecognized. It is not, therefore, generally known that copper toggle-head harpoon use was so common as it was among various prehistoric American Indian (and other prehistoric) copper cultures.

In this research we have analyzed only one type of toggle-head, the Conical Toggle-Head Type. There are many other types of copper toggle-heads not reviewed in our study. In addition there are many types of fixed headed harpoons. It is obvious, therefore, that although toggle-heads were well-used, other types of copper harpoons were also used throughout prehistoric periods and into present times. These harpoons existed and persisted because they perform some harpoon work tasks better than did the durable, versatile toggle-head. In future research we will analyze some of the other types of copper harpoons used by prehistoric American Indians.

Recommendations

Museum and private collections are full of copper harpoons and many go unrecognized. Some conical harpoons show the remains of wooden staffs in their sockets. We recommend the following: Step One, conduct an inventory of private and public collections for harpoon candidates. Step Two, verify, as possible, the provenance of each conical Harpoon candidate. Step Three, analyze harpoon candidates and classify them by Genre, Type and Variety. Finally, conical harpoons with associated organic materials must be radio carbon tested and dated.

We also need fishing experiments with the reproduction of ancient harpoon specimens to verify the work tasks of various harpoon traits found on copper conicals and the serviceability of wrap arounds and other line fasteners and harnesses. These are good tasks for students working on graduate degrees. Further, we need more detailed analyses of various prehistoric American Indian tools and various traits common to certain tools.

Finally, we need more archaeological digs at Old Copper Complex Technology sites, the recovery of more prehistoric American Indian copper implements and ornaments with archaeological histories. Specifically we need more identification of specimens archaeologically associated with dates, cultures and types.

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Appendix Glossary Of Terms Relating To Toggle-Head Conical Harpoons

Barbed Conical Harpoon: The barb on a conical harpoon is diagnostic of use as a toggle-head harpoon. Conical Toggle-Head Harpoons often exhibit a single base-barb consisting of the lengthening of one side of the socket to form a backward pointing barb with a rounded point-tip, which is the distal point of the harpoon head base. See *Barbed Conical Harpoon, socket, conical, Toggle-Head, Harpoon*.

Base-Barb: In the study of prehistoric American Indian copper artifacts, the term base-barb usually refers to projectile points. A barb is a sharp point projecting in reverse direction to the main point of a weapon or tool such as arrows, harpoons and fishhooks. Conical Toggle-Head Harpoons often exhibit a single backward pointing base-barb consisting of the lengthening of one side of the socket to form a barb with a rounded point-tip, which is the distal point of the harpoon head base. See *Barbed Conical Harpoon, socket, conical, toggle-head, harpoon*.

Barbs: (1) A sharp point projecting in reverse direction to the main point of a weapon or tool such as arrows, harpoons and fishhooks. (2) The barbs on a Barbed Point were created on its tang, perpendicular to the tang and used for hefting. (3) The teeth on a saw or the teeth on the tang of a Serrated Point. Conical Toggle-Head Harpoons often exhibit a single backward point base-barb consisting of the lengthening of one side of the socket to form a barb. See *Barbed Conical Harpoon, socket, conical, toggle-head, harpoon*.

Clad(s): Clothed in or covered with metal. Copper used to cover the working ends of digging sticks, harpoon heads fastened to wooden shafts, and other copper clad tools. See *insertion* and *enclosure, digging stick, open-point harpoon***.**

Conical: Conicals are common cone shaped *copper projectile points, (including harpoons)*, *digger stick clads, tinkle cones, awls, drills*, etc. Often, most of the conical consists of a socket, like an ice cream cone, open at the bottom only. Other conical sockets are open top to bottom. But still others are open top and bottom. In between, they may be closed or partially closed. Many conicals are recovered at or in water sites. See *socket, harpoon, toggle-head harpoon, barb, base-barb, open-tip*.

Conical Harpoon: A copper cone over a wooden shaft and used as a harpoon. Some copper cones are loosely fitted over wooden shafts and contain barbs, drilled holes, toggle pins and lines to fabricate toggle-head harpoons. See *conical, conical harpoon, conical points, tinkle cones*, and *pike*. Not all conical spear points are harpoons.

Division: In prehistoric American Indian copper artifact taxonomy, division is a sub-taxonomic class of kind. Weapon kinds, for example, consist of multiple sub-taxonomic division classes. Examples are: *knife division, axe division, projectile point division,* etc. Divisions consist of the sub-taxonomic classes, *genres*. The *projectile point division*, for example, includes: *arrowhead genre, dart point genre, atlatl point genre, harpoon genre* and *spearhead genre*.

Entrance Hole: In the study of prehistoric American Indian copper artifacts, Entrance hole usually refers to the piercing hole made when a spear or another projectile point, particularly a harpoon point, enters the prey. See *toggle-head, Toggle-Head Harpoon*.

Fasteners: In the study of prehistoric American Indian copper, fasteners include copper pins, nails, staples, clamps, punched holes and sockets. In the study of copper Toggle-Head Harpoons, fasteners include: punched holes, holes in open-tipped conical harpoon heads, nicks, grooves, swellings, wrap arounds, and other copper toggle-head traits used to fasten toggle-lines to toggle-heads. See *toggle, toggle-head, toggle-line, harpoon, open-tip conical harpoon head trait, wrap- arounds*.

Genre: In prehistoric American Indian copper artifact taxonomy, *genre* is a sub-taxonomic class of *division*. The projectile point divisions, for example, consist of: *arrowhead genre, dart point genre, atlatl point genre, harpoon genre,* and *spearhead genre*. The sub-taxonomic classes of *genre* are *types*. *Types* of the *spearhead genre*, for example, include: *Oval Rat Tail, Turkey-Tail, Serrated Point, Socketed-Triangulate*, etc.

Harness: In the study of prehistoric American Indian copper, harness usually refers to a system of lines which make up the three main parts of Toggle-Head Harpoons: (1) a detachable point, (2) a detachable wooden shaft, and (3) a line. Harness is composed of two or more lines: main-line and toggle-line. After penetration, harness converts a detachable point into a toggle inside the prey. See *harpoon, Toggle-Head Harpoon, entrance hole, line, toggle-line, main-line, conical*.

Harpoon: A barbed spear like implement used to spear fish and other marine prey. The harpoon is classified as a taxonomic sub-class of *Tool Kind*. The divisions of Tool Kind include the Projectile Point Division, which is sub-divided into several genres, including the Harpoon Genre. The taxonomic class Harpoon Genre consists of many Harpoon Types and their many varieties. See *spear, leister, barbs,* and *prongs*.

Line Fastener: In the study of prehistoric American Indian copper artifacts, a line fastener is part of a toggle harpoon head used to secure a line or lines to the copper toggle harpoon head. Holes in sockets, grooves around the point or its tang, notches, swellings and simple wrap arounds are example of line fasteners. See *tang, harpoon head, Toggle-Head Harpoon, line, toggle-line, main-line, wrap arounds*.

Main-Line: In the study of prehistoric copper artifacts a main-line is a part of a Toggle-Line. There are two types of main-lines. The first is a Simple Toggle-Line consisting of a single line fastened in one spot to a line fastener on a Toggle-Head Harpoon. Some Toggle-Head Harpoons have two line fasteners and Toggle-Line between the two. The long main-line is fastened to the short Toggle-Line. See *Toggle, toggle harpoon, line, toggle-line*.

Open-Tip: In the study of prehistoric American Indian copper, an open-tip refers to copper conicals with the top of the socket open - as bottom of all sockets are open. An open-tip socket on conicals allowed the wooden shaft to extend through the socket and protrude out of the conical top. The harpoon was thus provided with a wooden point-tip. Open-tips on copper conicals are a trait diagnostic of conical use as Toggle-Head Harpoons. See *point-tip, conicals, harpoons, harpoon head*.

Point-Tip: All blades, knives or projectile points, have *segments* and one segment is the blade's point-tip. Point-tips are defined by their *traits*, which distinguish one point-tip from another. Examples of point-tip traits include: pointed, blunt, sharp, dulled, rounded, piercing, bent, broken, reworked, narrow, wide, short and long. *See point-tip traits, point, blade, harpoon, spear, arrow, atlatl head*.

Toggle: A toggle is small rod-like object inserted into a hole like object to connect two objects, something like a button (toggle) in a button hole that connects two parts of clothing. In the study of prehistoric use of copper, toggle often refers to a detachable harpoon head that enters a penetration hole, then pulled crosswise with a tug on a toggle-line. See *toggle-line, main-line, Toggle-Head, Harpoon, conical, conical harpoon, fasteners, wrap arounds, entrance hole*.

Toggle-Head Harpoon: A three-part harpoon consisting of (1) a copper foreshaft fitting over (2) a removable main shaft and attached to (3) a line. The foreshaft is sunk into the pray, which is pulled in by line. A Toggle-Head Harpoon is a harpoon head, which detaches from a wooden staff and with the aid of a toggle-line and becomes a toggle inside the prey.

Toggle-Lines: Toggle-Lines connect two *Wrap Around Line Fasteners*. They serve two purposes. (1) They connect the *Wrap Around Lines* to the *main-line*, (2) Toggle-Lines prevent *Wrap Around Fasteners* from slipping over the *Point-tip* or the *Conical Base* and disconnecting the *Harness*. And finally (3) The harpoon strikes the prey's side perpendicular to the point of impact. After entering the target, a tug on the toggle-line turns it sideways, preventing the harpoon head from exiting the entrance hole. See *point-tips, open-tips*, *toggle-line, main-line, Toggle-Head, Harpoon, conical, conical harpoon, fasteners, wrap arounds, entrance hole*.

Toggle Pin: A toggle pin is a toggle created to fit into a hole to couple two objects, a toggle button in a button hole, a Toggle-Headed Harpoon inside a prey, and a toggle pin fastened to the end of a toggle-line inside a socket on a Conical Toggle-Head Harpoon. See *toggle, toggle pin, toggle-line, Toggle-Head Harpoon*.

Type: In prehistoric American Indian copper artifact taxonomy, *Type* is a sub-taxonomic category of *genre*. Samples of the *spear point genre*, for example, *include: Oval Rat-Tail, Turkey-tail, Serrated Point, Socketed-Triangulate,* etc. The sub-taxonomic class of Type is variety. Varieties of the *Socketed-Triangulate type spear point* include: the *pinhole variety,* the *stepped variety,* the *round-shouldered variety,* the *barbed variety,* etc.
Type exhibits the general character or structure (set of characteristics) held in common by a number of artifacts. Type is an example or a model exhibiting the ideal features of a class, the essence of copper taxonomy. And Types are diagnostic of both age and culture.

Wrap Around(s): Wrap arounds or wrap around lines are lines or hafting aids wrapped around implements to secure them to their shaft, or in the case of Toggle-Head Harpoons, to secure the line to the toggle-head. Two wrap arounds, one each near opposite ends of a copper toggle harpoon head or a single wrap around near one end and a different line fastener trait at the other end, are secured with a toggle-line extending between them. A toggle harness is secured between two wrap arounds. See *toggle, Toggle-Head Harpoon, line, toggle-line, line fastener.*

Variety: In prehistoric American Indian copper artifact taxonomy, variety is a sub-taxonomic class of type. Samples of spear point types are, for example: *Oval Rat-tail type, Turkey-tail Type, Serrated-point Type, Socketed-triangulate Type,* etc. Sample varieties of the *Socketed-triangulate Type*, for example, include: the *pinhole variety,* the *stepped variety,* the *round-shouldered variety,* the *barbed variety,* etc.
Variety is the 7th and final copper taxonomic class, a subclass of type. Additional steps in analyzing artifacts involve studying artifact parts. See *nomenclature*. See appendix no. 2.
Varieties of type may result from: (1) intended use, (2) experimentation and a changing technology, (3) the tools and copper available at the time of creation, (4) the level of individual workman proficiency, and to some degree, (5) by chance. If variation of type is due to: (1) intended use or (2) experimentation and changing technology, it is safe to classify the object as a separate variety.
Slight differences due to (3) the availability of tools and copper, (4) the level of individual smithing proficiency, or (5) due to chance, does not justify a separate variety classification.

The Chalcolithic Period
Or Copper Age

The term Chalcolithic Period or Copper Age is one used primarily in the Old World. This term describes an historical period of time, roughly 5000 BC to 3300 BC, depending on location, when man used both stone and metal. The metal employed during the Chalcolithic Period was limited to copper, which was not yet alloyed with tin to form bronze (Bronze Age). The term Chalcolithic is of Greek origin. Chalco (khalkos) means copper, while lithic (lithos) is the Greek word for stone.

28 Tons of Mass Copper or Float Copper - Michigan

Fig. 1: A 1997 Twenty-eight Ton Discovery From Hancock MIchigan - Nearly 15 Feet In Diameter

During the early Chalcolithic Period native copper was pounded and annealed. While diminutive nuggets were hammered into small copper artifacts, larger nuggets were formed into bigger specimens. And copper boulders were divided into workable chunks of native copper.

During the first few hundred years of the Chalcolithic Age, the availability of native copper nuggets (an ounce to a few pounds each) diminished as demand for copper implements and ornaments grew. Necessity gave birth to an advanced copper technology. And by Middle Chalcolithic times, coppersmiths had learned to smelt copper ore and cast it in molds. Smelting and casting led to alloying tin with copper and thus, the Bronze Age.

In North America, Michigan was blessed with the world's largest supply of native copper ranging from nuggets weighing less than 1/10 oz. to boulders or masses of copper weighing hundreds of tons. Smelting and casting, therefore, never became necessary. Recent analyses of prehistoric copper artifacts indicate various prehistoric copper cultures may have experimented with melting and casting copper nuggets, but such experimentation remained very rare and atypical. Pounding and annealing persisted as the *primum mobile* from Late Archaic times through the Fur Trade era north of the Reo Grande.

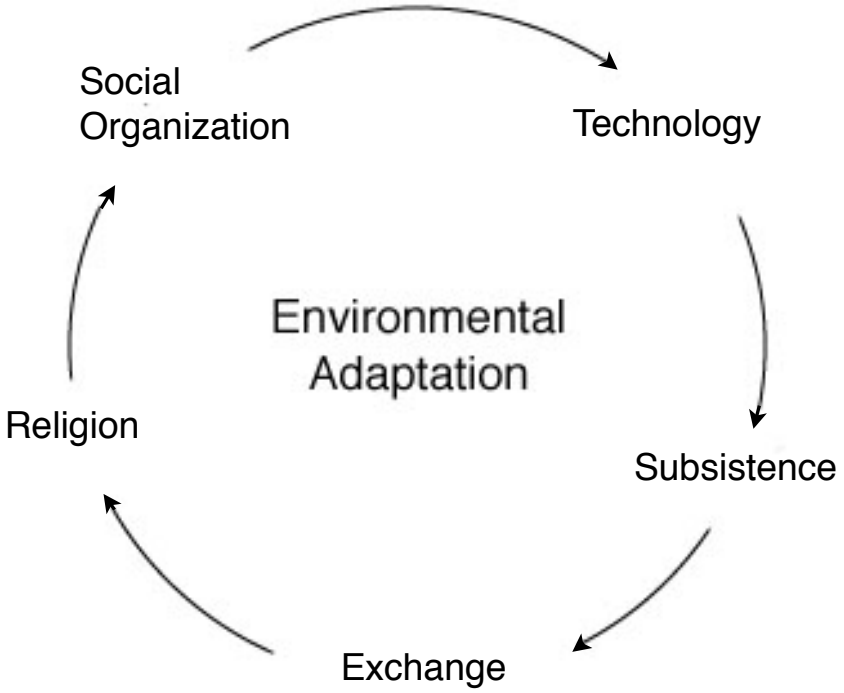
Fig. 2: Small Native Copper Nuggets: Less than 1/10 oz. to 1

Fig. 4: A 699 Pound Copper Boulder

Ontonagon Boulder

Fig. 3
The 3, 708 Pound Ontonagon Boulder, Curated By The Smithsonian Museum

Model Of Old World Pre-Modern Culture



Two Systems
Of Emerging Chiefdoms And The Beginning Of Social Inequities

1. Staple Finance (Earlier)

1. Absence of exchange
2. Dispersement of goods for services and allegiance
3. Feasting
4. Storage

2. Wealth Finance (Later)

1. Procurement: items of symbolic value
2. Possible long distance exchange or
3. Patriotism of craft and production
4. Work Shops
5. Prestigious objects & trade among elite groups

Presented by Thomas Levy, May 10, 2013

Comparing An Old World Pre-Modern Culture With New World History

The emergence of chiefdoms (1) Staple Finance, (2) Wealth Finance (see above) and the beginning of social inequity, as theorized in this Model of Pre-Modern Culture (Levy 2013), probably applies to the New World as well as it does to the Old World. The model is, however, based in part on the development of the Chalcolithic Period, which was in turn founded on a robust and fluorescing metal technology, one that gave birth to the Trident of Metallurgy: (1) smelting copper from its ore, (2) casting reduced (extracted) copper in molds and eventually, (3) alloying extracted copper with tin to form a new metal, bronze.

Steps (1) and (2) buttressed the Old World Chalcolithic Period or Copper Age, 5,000 BC to 3,300 B. C. These first two steps led to the production of many (a) objects of symbolic value, (b) items of domestic value and (c) prestige articles associated with religion and rulership in chiefdoms (see Figs. C1 & C2). These same objects provided for trade and a basis for wealth. Step (3) alloying tin to copper gave birth to the Old World Bronze Age.

To suppose the bronze age and its prefatory, the Trident of Metallurgy, was a prerequisite to the emergence of chiefdoms is to deny that New World Cultures followed a similar chiefdom model. In the New World, Michigan was blessed with the world's largest supply of native copper ranging from nuggets weighing less than a 1/10 oz. to boulders or mass copper weighing hundreds of tons. Smelting and casting, therefore, never became necessary. Recent analysis of prehistoric copper artifacts indicate various prehistoric copper cultures may have experimented with melting (not smelting) and casting copper nuggets, but such experimentation remained very rare and atypical.

Fig. C1

Chalcolithic Prestige Article, Israel

Still, the emergence of chiefdoms occurred here in the New World, just as it did in the Old World. And so, too, did social inequity, noble-like authority, rank and privileges for chiefs (rulers), if such practices weren't here from the beginning. As a matter of fact, we theorize that Chalcolithic metallurgy, the organization of food production and its storage for times of need, and the patriotism of crafts were not prerequisites to the rise of chiefdoms. We further theorize that articles of symbolic value and prestigious objects were traits found in pre-chiefdom societies. They just weren't as common because populations were smaller. And earlier artifacts (objects with symbolic value and prestige articles) were seldom constructed so perfectly nor as durable in pre-chiefdom times as they were using Chalcolithis smelting and casting technologies. By the same token, pre-chiefdom leaders appear less important, as we look back on them, because they commanded fewer peoples and smaller

territories. Similarly, they produced fewer imposing works of art and less durable structures for us to admire. And then, too, they were less likely to record their presence in history.

Finally, we hypothesize that pre-chiefdom leaders and formal chiefs acquired their leadership positions in similar circumstances, albeit the control of food caches made it easier for chiefdom leaders to force their will upon others.

The path to leadership is blind to time, geography and culture. Leadership qualities include physical size, strength, talent, intelligence and likability. And as among herd animals, candidates competed for leadership. The one with the richest combination of leadership qualities emerged as chief. Whereas chiefdom leaders may have used stored food as leverage to gain and retain power, pre-chiefdom leaders used freshly killed meat, women, the spoils of war and natural leadership qualities to win favor for necessary supporters.

Differences between cultural development, including the rise of chiefs and the exercise of leadership, were probably not significantly unlike, around the world. South of the Reo Grande, European explorers made direct contact with advanced civilizations early on while seeking gold. Here, in United States and Canada, contact was slower, later and less intense during the first couple centuries.

It is thought that first contact in the north, a few European farmers and adventurers, brought disease. Diseases passed from tribe to tribe and killed more than 50 percent of many native populations. And most cultures were denigrated (Mann 2005: 93-96). We later based our ideas of American Indian cultural development, one lasting over a period of many millennia, upon societies earlier debased by European diseases.

Aztecs, Mayas, Incas and other advanced cultures struck down with the sword before they were devastated by disease, proved that organized government developed as well and as fast, if not faster, in the New World than in the Old World. The natural maturation of government order and control probably led to chiefdoms everywhere.

Fig. C2

Part of Nahal Mishmar Chalcolithic Hoard
Copper Prestige Article, Israel

Levy, Thomas E.
2013 The Chalcolithic Metallurgical Revolution, lecturing At The Friends Of Israel's Antiquity Society, May 10, 2013. Also Published In Bible Daily Journey To The Copper Age, July 29, 2013.

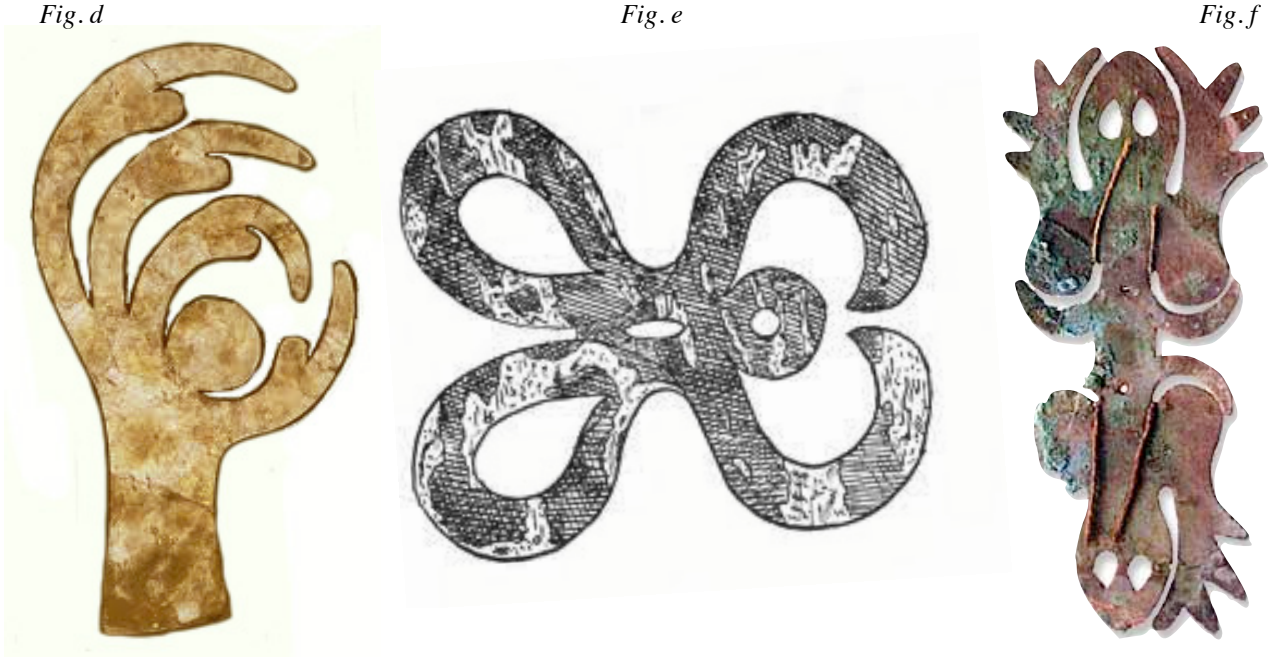
Mann, Charles C.
2005 1491 New Revelations Of The Americas Before Columbus. Alfred A. Knope New York. p 93-96.

Three Copper Ornaments
Moche culture ca 100-400 BC

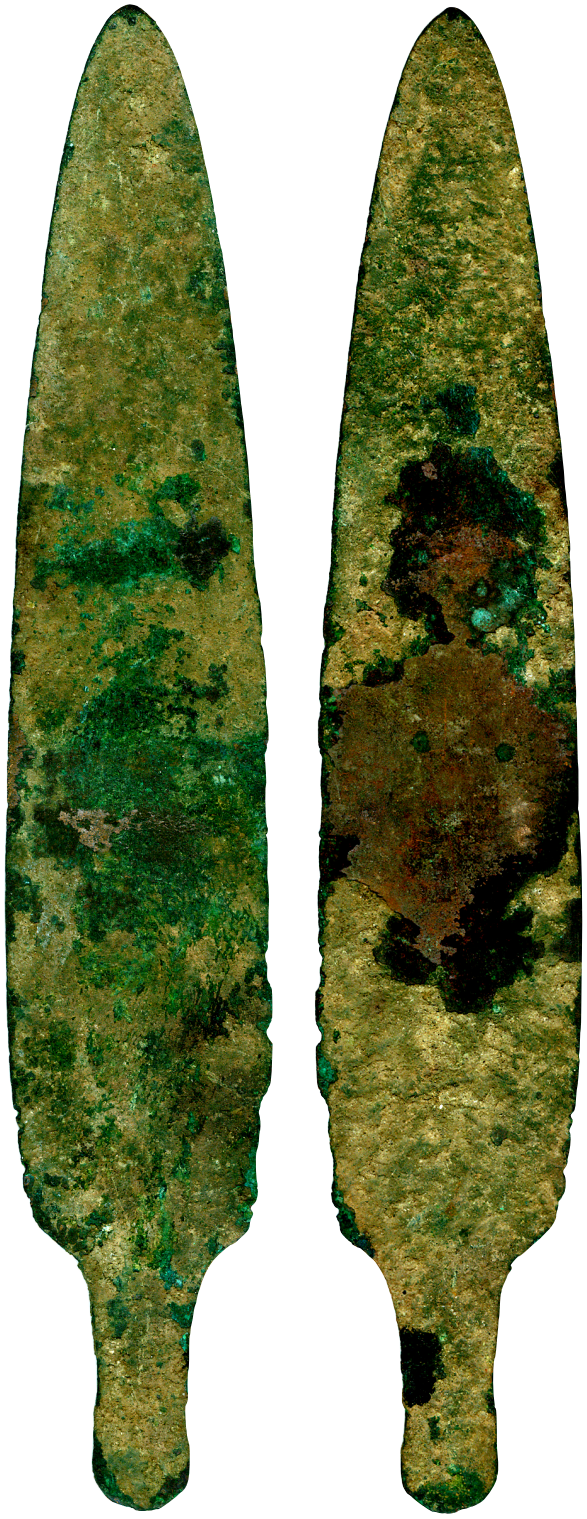
Fig. a *Fig. b* *Fig. c*

Three Somewhat Similar Ornaments
Hopewell Copper ca 400 BC - 500 AD

Fig. d *Fig. e* *Fig. f*



Pommel Tang – British Columbia
PT BC 01



This specimen, now curated by Great Lakes Copper Research, was once part of a collection from Southern British Columbia and previously owned by Gilbert Cooper.

A Pommel Tang Type has a Tang-Base wider than the middle tang shank. Pommel Tangs are recovered from Ontario, British Columbia, Wisconsin and Michigan. Although called a Pommel Tang, tangs are generally not handles and pommels are not true pommels, but probably hafting aids.

Statistics:

Object:	Pommel Tang Spear Point
Inventory	PT.BC.01
Provenance:	Southern British Columbia
Length:	7 & 15/16th inches (203 mm)
Width:	1 ½ inches (38 mm)
Thickness:	Blade 1/16 inch (.158)
	Tang 1/8th inch (3.17)
Weight:	2.2 oz (64 g)

Taxonomic Classification:

Kingdom:	Mineral
Family:	Copper
Kind:	Tool (or weapon)
Division:	Knife (or projectile Point)
Genre:	Butcher Knife (or Spear Point)
Type:	Pommel Tang
Variety:	Minimal Pommel
Culture:	Probable Glacial Kame
Circa:	2,000 B.C to 500 AD

Curated By Great Lakes Copper Research

The Archaeological Record

The term, archaeological history or record, encompasses all archaeological evidence including the physical remains of past human activities found at archaeological sites. Archaeologists seek out and record the archaeological history in an attempt to analyze and reconstruct the past. Archaeology teaches that the value of an artifact lies primarily in the data that can be acquired about its culture – obtained in an interpretation or analysis of the artifact and its archaeological history during professional excavations. Archaeologists understand that without the archaeological record, much valuable data is lost and artifacts are sometimes made more or less useless.

Collectors, on the other hand, see value in artifacts themselves, as primitive art, valuable treasures, and objects of sentimental value. Some collectors accumulate much knowledge and experience in recognizing distinctive differences, even cultural distinctions between specimens with similar and contrasting traits. But most collectors do not perform professional excavations, nor do they note soil conditions, stratigraphy, features, artifact links, associated carbon materials, and other elements of an archaeological history. If untrained collectors dig, archaeological records are lost.

Most artifacts collected by amateurs over the years consist of surface finds. If they possessed an archaeological history, it was lost long before the artifacts were picked up by finders. For most of our nation's history, it was farmers following horses who found copper artifacts. Collectors walking freshly worked fields found still more, while construction workers uncovered the remainder as fortuitous finds.

Late in the game, archaeologists excavated burial sites and recovered the first copper artifacts with archaeological histories. Archaeologists' knowledge of copper is based upon these two groups of copper artifacts, old surface finds, without archaeological records, and later professionally excavated grave sites with clear archaeological histories.

Finally, since the 1980's or so, metal detecting has added a third reservoir of copper artifacts. Like the first group of old surface finds, metal detected copper no longer possesses an archaeological history. It often had one, a good clear archaeological history, but it was nearly always lost in the recovery.

Archaeology, for the most part, has chosen not to study metal detected copper. This is true, in part, because it contains no archaeological history. It is also true because archaeologists cannot professionally encourage the acquisition of copper artifacts in ways that assure the loss of archaeological data; a necessary element in the discharge of tasks required in the practice of their profession.

At Great Lakes Copper Research, we developed a paradigm designed to harvest previously unavailable data from copper artifacts separated from their archaeological record. We do not wish to encourage the separation of artifacts from their archaeological history. We wish all artifacts had archaeological histories and recognize the superior data associated with archaeological records. But, we also recognize the fact that most copper artifacts are shorn of their archaeological records, and we wish to benefit from potential valuable data that can be harvested from orphaned copper artifacts.

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