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ANTHROPOLOGICAL PAPERS

OF THE

American Museum of Natural
History.

Vol. I, Part VI.

IROQUOIS SILVERWORK,

BY

M. R. HARRINGTON, A.M.

NEW YORK:
Published by Order of the Trustees.
September, 1908.

American Museum of Natural History.

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VOL. I, PART VI.

IROQUOIS SILVERWORK.

BY M. R. HARRINGTON, A. M.

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IROQUOIS SILVERWORK.

The art of the silversmith among the Iroquois seems to have had its birth along toward the end of the seventeenth century, when, according to Beauchamp,¹ historical records show that silver ornaments of Indian make were first noticed by Europeans. These ornaments had apparently displaced in part those of copper and brass, which, although quite different in character, had been popular among the people. The brooches, rings, and bands of silver, Beauchamp continues, remained in vogue until the latter half of the nineteenth century, when they gradually gave way to the cheap jewelry of the whites. To-day it is rare to see native ornaments used even in the Long House ceremonies of the so-called Pagan Iroquois.

Morgan² and Beauchamp³ devote but very few lines to the manufacture of silver ornaments, and merely mention some of the tools used. Knowing this, I have always been on the lookout, during my visits among the Indians, for a surviving Iroquois silversmith; but it was not until January, 1907, that my search was successful. At that time I was engaged in collecting ethnological material, on the Six Nations Reserve in Ontario, Canada, for the American Museum of Natural History. Repeated inquiries for silversmiths and their outfits of tools led at last, after several failures, and many investigations of false reports, to the discovery of an ex-silversmith in the person of Chief Levi Joe (an Onondaga), and of a nearly complete outfit of tools, once the property of his grandfather. Chief Joe is not an old man; but his vision has become defective, and he has been obliged to give up his calling. After several interviews I succeeded in buying the box of tools and in obtaining the Indian names of each piece, besides observing several of the processes, and taking a few photographs. Later the chief explained to me as much as occurred to him concerning the details of silversmithing, and made working models of several articles once belonging to the outfit, but now lost. As all his old patterns were missing, he made some new but rather poor ones, and at my request prepared for me two unfinished brooches to illustrate stages in the process of manufacture. Some months later a second visit was made, and more specimens and information were secured.

¹ Beauchamp, *Metallic Ornaments of the New York Indians*, p. 10.

² Morgan, *League of the Iroquois*, new edition, Vol. II, p. 50.

³ Beauchamp, *Metallic Ornaments of the New York Indians*, p. 36.

Before taking up in detail the description of Chief Joe's outfit and method of work, I will endeavor to discuss briefly the principal classes of native-made silver ornaments still found among the Iroquois. As a number of writers, including Mrs. Converse¹ and Beauchamp,² have given us careful descriptions of their many varying forms, it will only be necessary here to set forth a few representative types.

Most numerous of all are the brooches which may still be found occasionally in the hands of the Indians. Those, as may be seen in the figure, are flat silver disks of different sizes, ranging from about a fourth of an inch to six inches in diameter, cut into many artistic forms, and often engraved, stamped, and embossed as well. Each has a central opening, crossed by a tongue (like that of a buckle) pivoted at one end, which serves to attach it to the fabric. Six principal patterns may be recognized, which I have called: 1. Simple disk; 2. Ornate disk; 3. Star; 4. Heart; 5. Square; and 6. Masonic.

The first is merely a simple, very narrow circlet of silver, usually convex above and concave beneath, with a large central opening (Plate XXIII, Fig. 1). Sometimes the narrow circlet is solid instead of hollow, in which case it is sometimes decorated (Plate XXIII, Fig. 2).

The ornate disk is quite distinct from this, as the central opening is as small as possible, and the resulting broad surface of the silver, or field, is highly decorated with engraving, embossing, and openwork (Plate XXIII, Figs. 7, 8, 9). The star is similar to the ornate disk in having a small central opening; but in this case the silver field is cut into rays of varying number, forming a star-shaped figure. Each ray is tipped with a circular boss, which lends a pleasing and characteristic effect to the whole (Plate XXIII, Figs. 13, 14). The heart-shaped brooches are among the commonest forms. They generally consist of two overlapping heart-shaped figures surmounted by a device which sometimes resembles a crown, and sometimes an owl's head. The hearts are outlined by a narrow band of silver, the tongue passing across the resulting central opening; while the broader surface of the crown affords a field for engraving and openwork. A variant of this pattern represents a single heart only, with or without the characteristic crown or owl's head above (Plate XXIII, Figs. 3, 4, 5). The term "square" is rather a misnomer for the fifth type of brooch; for the two concentric figures which make the characteristic form are squares only by virtue of having four equidistant corners, the four equal sides being concave instead of straight (Plate XXIII, Fig. 10). The corners even are so blunt, as a rule, that the type might be called "octagonal." Like the heart-type, the squares are outlined with

¹ Converse, H. M., *The Iroquois Silver Brooches* (54th Report New York State Museum).

² Beauchamp, *Metallic Ornaments of the New York Indians*, pp. 74-94.

narrow strips of silver just wide enough to bear a little engraving, and consequently they have a broad central opening across which the tongue passes from corner to corner. Single squares occur (Plate XXIII, Fig. 11), and these like the majority of the simple disk-type, are sometimes concave beneath.

The Masonic type is merely the familiar square and compasses, sometimes conventionalized and ornamented (like the specimen shown in Plate XXIII, Fig. 15), almost beyond recognition. I may say here that most Indians do not recognize the significance of this pattern, but use it simply as an ornament.

Specimens of all the principal types of brooches are figured in this paper; but, as the many variations and aberrant forms are carefully discussed in the works above referred to, it is not necessary to take them up in detail. It is sufficient to say that the variations are effected by the different forms and sizes of the apertures and notches cut into the metal, by bosses raised at various places (notably at the ends of the rays of the star-form and around the circumference of the disks), and by the different varieties of engraving. I have seen dots, straight lines, curved lines, fine zigzags, tiny triangles, and other figures in many combinations. Life forms are very rare.

Chief Joe had names for a number of the patterns. The simple disks he called *o-ga'-hä*, which signifies "eye." The ornate-disk and star types he grouped together under the name *de-yo-dëⁿ-hai'ëⁿ-da'*, interpreted as "sunshine." The crowned heart brooches, double and single, were similarly grouped as *o-gō'-ji-a*, meaning "ornamental head-dress or crown;" while the single heart-form was known as *a-wë'-ya'-sa'* or "heart." The double-square type he named *de-yo-äⁿ-wa-gis'-hoⁿ*, translated as "double brooch;" the single-square form being *jo-äⁿ-wa-das'-hoⁿ* (*de-yo-äⁿ-wa-das-hoⁿ?*) or "single brooch." When shown a Masonic brooch of pure type, the chief told me he knew no name for that variety; but the more common conventionalized Masonic design (the kind shown in Plate XXIII, Fig. 15) he readily recognized under the name *ga-ya'-sa^a*, "cross" or "crucifix," so called, he said, on account of the fact that it usually bears from two to five engraved conventional crosses. This type originated with Christian Indians, he informed me.

The only trace of true symbolism was found when the chief was questioned concerning the heart-type of brooches. He stated that the intertwined hearts surmounted by a crown represent the Iroquois nations united in friendship, and that these brooches were formerly considered a sort of badge or emblem identifying the wearer, man or woman, as an Iroquois. Chief John A. Gibson told me practically the same thing. The only outside evidence to support this idea lies in the fact that brooches of the crowned

double-heart variety are rarely, so far as I know, found outside of the Iroquois Six Nations. Mrs. Converse,¹ offers interpretations for many forms, and I refer the reader to her pamphlet. As there is usually a great deal of variation in statements by Indians concerning symbolism, more data should be collected; for, notwithstanding all these differences, some underlying concepts may be discoverable.

Brooches were employed for many decorative purposes, as the ornamentation of women's dresses, where they were sometimes used in great profusion, and for decorating the ribbons, head-bands, and sashes used by both sexes. I have seen them fastened also upon the wide band of broadcloth used to wrap about the infant on the cradle-board. It will be noticed that all these uses require attachment to some fabric, which was effected as follows, — a portion of the cloth was bunched together and forced up through the central opening of the brooch far enough for the tongue to be pushed through it, then, when the fabric was pulled flat again, the ornament was firmly attached. The process is shown in Fig. 1.

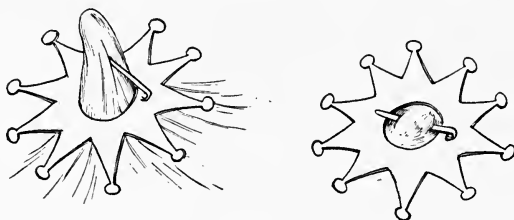


Fig. 1. Method of fastening Brooches.

Brooches are generally called *ën-yü''-skä'* in Seneca, and *dëⁿ-ha-nis-ta'* or *a-da-ha-nis'-ta'* in Onondaga. Beauchamp gives *ah-ten-ha-ne-sah* as an Onondaga name for them, but this probably is a variation of the above. The Cayugas often call them *an-ya'-ska*; the Oneida, *a'-nyu'-ska-list*; and the Mohawk, *an-yü''-ska-re*. It must be understood that in all these languages there are probably several words that can be applied to each article.

Next in point of numbers to the brooches are the ear-rings, formerly widely used by both sexes, but now usually confined to a few women. The men, when wearing ear-rings at all, now generally prefer the small, plain gold hoops made by the whites. Ear-rings of native manufacture may be divided into two classes. The first type and the commonest form (Plate XXIII, Figs. 18, 19) consists of a drop, or body to the flat back of which is soldered the hinged wire passing through the ear, as shown in Fig. 2. This

¹ Converse, H. M., *The Iroquois Silver Brooches* (54th Report New York State Museum).

drop may be a small hemisphere, called "chestnut" by the Indians (Plate XXIII, Fig. 19), or may be large, flat, and decorated with openwork and engraving like a brooch. Sometimes it is cut into the form of a spread eagle, hawk, or other bird (Plate XXIII, Fig. 16), and sometimes has a setting of colored glass (Plate XXIII, Fig. 18). Removable pendants often hang from these drops attached to the ear-loop, usually pear-shaped, but occasionally of other forms. Now and then they are also set with colored glass, and sometimes strings of hollow silver beads are used as pendants. Another form is shown in Plate XXIII, Fig. 20. The second type embraces the plain silver hoops (Plate XXIII, Fig. 21), which are rare, and the flattened hoops or crescents, which I have heard called "half-sun" ear-rings. Common words for ear-rings are *a'-wüs'-hä* in Seneca, *ga'-was'-ha* in Cayuga, *ka-wa'-sa* in Onondaga, *ka-was'-ha* in Oneida, and *de-a-ga-wa'-sa-re* in Mohawk. This last word, I suspect, means a "pair of ear-rings," as the prefix "de-" often expresses duality in Iroquois languages.

Finger-rings were also of silver, either plain, or decorated with hearts or other devices engraved upon a part of the circlet made broader for the purpose, or upon a separate piece soldered upon the band, the whole having a seal-ring effect (Plate XXIII, Figs. 23, 24, 25, 26). In Cayuga, rings are called *eⁿ-n'ia'-ha-shra'*; by the Oneida, *ha-ni-soⁿ-so-lok'-ta*; and by the Mohawk, *a-nis-nu'^u-sa-wi*.

Bracelets and armlets were broad bands of silver, usually quite thin and pliable, with holes in the end for fastening with cords. The pair in the Museum, however, are rather thick and stiff, like the Navajo bracelets, and consequently need no holes (Plate XXIV). They are also engraved, while the usual Iroquois bracelet is fluted. They are worn with ceremonial dress.

Of similar character, although larger and more ornate, are the head-bands or crowns of silver, often about two inches wide, which frequently show elaborate and tasteful combinations of fluting, engraving, embossing, and openwork. These are now very rare, but are still occasionally used as part of the ceremonial head-dress, as shown in Plate XXIV. Morgan¹ illustrates globular silver beads used with wampum as a necklace, and I have sometimes heard of double and foliated silver crosses made by the Indian silversmiths, and used as ornaments. Chief Joe, without any suggestion on my part, made for me a tin pattern for a double cross to go with

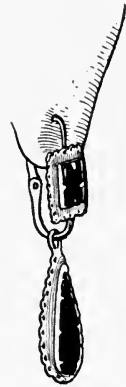


Fig. 2. Method of fastening Ear-Rings.

¹ Morgan, *The League of the Iroquois*, new edition, Vol. I, p. 254.

the rest of his outfit of tools. There is also a variety of silver ornament which I have never seen described, the silver nose-ring. The only specimens of this that I have seen were in the possession of King Tandy Jimerson, a Seneca of the Alleghany Reservation in western New York. There were two, I believe, of crescent-shape, the tips of the crescent approaching each other in such a way that the ornament could be pinched fast upon the septum of the nose. At least one of the specimens seemed old, but I doubt if the style was widely distributed.

We will now turn to a description of the tools with which these things were made, so far as they are represented by the contents of the battered tin box which Chief Joe found for me in the loft of his little cabin on the banks of the Grand River. The Indian names here given for the tools, as mentioned before, are probably not the only ones that could be applied to them, and it is possible that errors have crept in through imperfect interpretation. It is unfortunate that time would not permit my working out the literal meaning of the names themselves. The outfit as a whole is called *Ĕ-wfs-ta-no-wĕⁿ-tsĕⁿ-nia'-ta'*, and consisted of the following:—

Anvil, *De-ye-da-gwĕⁿ-dĕⁿ-da'-kwa'* (Plate xxvi, Fig. 4). This is naturally one of the most important articles of the outfit. It is a rectangular block of cast-iron, four inches and a half long, two inches wide on the top where the hammering was done, and three inches high. A perforation and some figures on the broadest sides seem to show that it was evidently made by the whites for use as a scale-weight; but the battered top, scarred with the marks of the silversmith's chisel, tells the story of its Indian use.

Hammers, *Ga-jĭ'-kwa* (Museum Nos. 50-6692, 50-6796). A large hammer, used to flatten out the silver to proper thickness, is shown in Plate xxvi, Fig. 1. Another specimen, a small one, is for fine cutting and stamping. It consists of a rude head of iron attached to a thin wooden handle, the whole being but little over six inches in length. This is figured in Plate xxv, Fig. 15.

File, *Ha-de-geⁿ-tsä'-nĕ* (Museum No. 50-6694). This is an ordinary three-cornered file bought at some store. The only interest attaching to it is in the fact that the end is worked down to a triangular point, which would do excellent service as a drill or reamer for perforating thin silver (Plate xxv, Fig. 14).

Pincers, *Do-was-jĭ-ĕ-ta* (Museum No. 50-6693). The pincers or pliers, rather rude yet serviceable, are of iron, made apparently by some county blacksmith. The rounded jaws were very useful in bending finger-rings and ear-ring loops (Plate xxv, Fig. 10).

Chisels for curves, *Ĕ-iák'-ta'* (Museum Nos. 50-6698, 50-6699). At first there were in the collection only two chisels for cutting along curved lines;

but two more were afterwards found. The first two are made of old jack-knife blades (Plate xxv, Figs. 20, 21). The truncated end of the larger one is filed to an edge like that of a gouge, in the form of a curve. The point of the second is very narrow, but is straight, the curve being produced by a succession of short cuts which were afterwards joined, and the resulting ragged edge filed smooth. Of the second pair found, one is a store-bought gouge, while the other is made of an old carving-fork handle.

Chisels for straight cuts, *Dē-ē-ia-k'-ta'* (Museum Nos. 50-6695-6697). There are in the collection, three chisels for cutting along straight lines, the most important of which is also made from an old jack-knife blade, whose battered base tells of long use. Its edge is five-sixteenths of an inch wide. With a longer edge (three-fourths of an inch) is another chisel, originally a cutter for a blacksmith's anvil. The third specimen (a small one, with an edge three-sixteenths of an inch) was actually made for a cold-chisel; but the Indian silversmith has purposely dulled, even squared, its edge, for use in fluting bracelets, head-bands, etc. (Plate xxv, Figs. 8, 9, 19).

Awls, *Ē-hak-ta'-so-a* (Museum Nos. 50-6703-6706). Three true awls and an ear-piercing implement were classed together under this name by Chief Joe. The largest is part of an old knife-blade filed down to the form of an awl, whose cross-section would be almost exactly square. Although the blade is hardly three-fourths of an inch long, the hardwood handle is fully four inches and a half long, and nearly three fourths of an inch thick. The second awl is similar in section, but is made of a broken drill-blade, and set in a smaller handle; while the third is a large broken needle similarly mounted, whose end has been sharpened by filing to an angular point (Plate xxv, Figs. 23, 24, 25). The ear-piercing awl is an ordinary needle mounted in a wooden handle like the rest (Plate xxv, Fig. 22).

Gravers, *Ē-ia-na'-da'-kwa'* (Museum Nos. 50-6700-6702). There are three gravers, all similarly mounted in crude home-made wooden handles. The largest is more like a chisel, having its edge bevelled from one side only, but seems nevertheless to be made of an old knife-blade. The other two have the bevel from both sides, like a drill; but the use of all three is similar, according to their former owner (Plate xxv, Figs. 11, 12, 13).

Die-plates and stamps, *E-ji-ni-u-gúⁿ-nia-ta'* (Museum Nos. 50-6805 A-B). The die-plate, used mainly for embossing, is a little block of iron about two inches long by an inch wide and a little less than a fourth of an inch thick. On its top surface are four hemispherical concavities of varying size, which served as dies. The largest, for working ear-drops, three-eighths of an inch across; and from this the dies for embossing range down to less than an eighth of an inch in diameter. The edge of the plate is roughly

bevelled. For each die there is an appropriate stamp or punch whose convex end fits into the concavity. Little can be said of these punches, except that they show evidences of long use, and, like the die-plate, seem to have been made especially for this purpose by some blacksmith, or perhaps some Indian with a smattering of iron-working knowledge (Plate xxv, Figs. 3, 4, 5, 6, 7). There is also a punch or stamp, the end of which has been filed into a pear-shape to form the pendant cone often used with ear-rings; but the die belonging to it is missing from the set (Plate xxv, Fig. 17). For making hollow simple-disk brooches is the lead die-plate (Plate xxv, Fig. 1) secured on the second trip. This bears a smooth circular groove the size of the future brooch, into which the thin metal is pressed with the aid of the punch (Plate xxv, Fig. 2). This outfit bears the special name O-ga-hē' gwa'-ē'-süⁿ-nia-ta'.

Cutter, O-ga-hē-gwa'-ē-yak'-tha (Museum No. 50-6801). This is a piece of iron bent into pipe-form and the edge of one end sharpened all around. It is made for cutting out disks of silver for brooches (Plate xxv, Fig. 16).

Spreader, De-ie-da-gwai-da'-kwa' (Museum No. 50-6707). This is a chisel-like implement used especially to spread the split in the wire to make the hinge in the loops of ear-rings. If it were not for its straight chisel-like lines and home-made handle, one might take it for a screw-driver (Plate xxv, Fig. 18).

Lamp, Ē-jīs'-to-da-kwa' (Museum No. 50-6723 A-B). This is merely an old rectangular sardine-can with lid removed and edges rounded. The wick is a twisted bit of rag, which when in use protrudes above the edge at one corner. Almost any inflammable oil or grease seems to have been used. The wick of the present specimen shows traces of having been used with sperm-oil, which of course is modern (Plate xxvi, Fig. 5).

Patterns, De-yoⁿ-de'-ni-ēⁿ-dēⁿs'-ta'-kwa' (Museum Nos. 50-6714, 6716). All the old patterns belonging to this collection are unfortunately lost; but Chief Joe made two new objects out of tin; one a crude representation of the star brooch, the other a very fair double cross (Plate xxiii, Figs. 22, 27). Mrs. Converse, in her "Iroquois Silver Brooches," mentions the fact that one silversmith had a collection of patterns made from the zinc back of an old washboard.

Box, Ga-húⁿ-sā (Museum No. 50-6690). This little tool-chest, resembling a trunk in form, is made of tin, and is provided with a handle and hasp. It is evidently of white man's make. The dimensions are eight inches and a half by five inches and a half by four inches and a half. All the smaller tools, patterns, etc., were kept in this.

Moulds, Ē-jī-sta'-hā-kwa' (Museum Nos. 50-6719-6721). There are

three moulds in the collection, one of which, the smallest, has been used. The others are merely models. The term "furnace" might well be applied to them also, for they are used for both melting and casting. The old specimen is made of a rather irregular block of hardwood some five inches square and three inches and a half thick. In one of its broad faces is cut a rectangular hole with converging sides about three inches wide and a little less than an inch deep, leaving a flat area in the middle. In the centre of this the mould proper was neatly cut, about an inch and a half long by half an inch wide and a fourth of an inch deep. Into this melted silver flows. The whole specimen shows the effect of long use, being heavily weathered and charred. The new moulds are larger and not so deep, the larger casting an ingot ten inches long by an inch wide, the smaller about seven inches long (Plate xxvi, Figs. 3, 6).

Blowpipe, *Uⁿ-wēⁿ-da'-sta'* (Museum No. 50-6722). This is a model, and is made of a hollow sumach-stick some fourteen inches long and an inch and a fourth thick, with one end cut to form a rude mouthpiece, but without a nozzle (Plate xxvi, Fig. 2).

Poker, *Tē-yē-jī-sta-wēⁿ-yē'-da'-kwa'* (Museum No. 50-6723). This is a wire at the end of, and inserted into, a wooden handle. It was used for raking up the coals on the mould-furnace above described.

Chief Joe mentioned a number of articles as being missing from the collection, of which the most important are the patterns, of which he furnished only two, both models, and poor at that. There should be patterns for every type of brooch and for the different parts of finger-rings and ear-rings. There are also missing the die-plate belonging with the stamp used for making pear-shaped ear-pendants, and probably other articles.

For the sake of comparison and to fill up these gaps, if possible, it was thought best to examine another Iroquois silversmith's outfit. The only other one¹ known to the writer is in the collection of the Montgomery County (New York) Historical Society, who kindly loaned the set to the Museum for study. This outfit, also of Onondaga origin, is very rich in small tools, and contains besides a number of old patterns. Glancing over the collection, one is struck at once with the fact that most of the cutting-tools are made of old files, in contrast to those bought of Chief Joe, which were mainly made of old knife-blades. The only gravers are files sharpened down at one end to a narrow chisel-like blade. Awls are represented by one specimen only. Still the general character of both collections is very similar. The die-plates are of lead, with holes for both round and pear-shaped stamps,

¹ Since writing the above, I collected a similar outfit from the Oneidas, which is now in the E. T. Tefft Collection in New York.

of different sizes (Plate xxvii, Fig. 11). It will be remembered that Chief Joe's plate to fit the pear-shaped stamp was missing. These stamps differ from those of Chief Joe in having provision for stamping out the halves of the pendants and the loops, for attaching them in the same operation, instead of making the loop of wire and soldering it on afterward as he would have done. All the die-plate holes have been made by hammering the stamps into the soft lead. Two pairs of pincers are of the ordinary commercial variety, although the jaws of one (Plate xxvii, Fig. 12) have been filed small and round for convenience in bending. But the third (Plate xxvii, Fig. 7) has been very ingeniously made of heavy wire, the natural spring of which holds the jaws firmly together. There are also two stamps for making tiny decorative circles on the faces of silver ornaments (Plate xxvii, Fig. 2), an implement also missing at first from Chief Joe's outfit, although obtained on a second visit. To make these, file-fragments have been worked down to a round point, which is truncated, and drilled out so as to produce the required circle when struck against the face of the silver. Another similar implement has simply a small rounded point for making the dots so often seen in the decorations on Iroquois silverwork.

Another unusual article is part of an old file with the end cut into a symmetrical crown-shaped stamp, the imprints of which could be combined in attractive patterns on the larger silver ornaments (Plate xxvii, Fig. 1). Still another implement (Plate xxvii, Fig. 4), resembling a curved chisel with purposely blunted and rounded edges, seems to have been used for rendering convex the narrow band of the single-disk brooch and for similar purposes. One of this kind was later obtained from Chief Joe (Plate xxv, Fig. 2), together with its die. The blowpipe belonging to this set is the regulation form, of iron, and is evidently of white man's make. There are quite a number of broken implements which may be accounted for by the hard and brittle quality of the steel in the files which furnished the material of which so many of the tools were made.

Several implements occur in the Historical Society's collection whose use is a puzzle to me. One is a very old piece of wood in the form of a thick paddle. There are also two stamps made of old files, with triangular stamping-faces which resemble in a certain way the rounded one used for embossing and making hollow ear-pendants (Plate xxvii, Fig. 3); but I have never seen an ornament made with this form of stamp, nor is there a die-plate to fit them in the collection.

There are five patterns, — three of the ornate-disk type, one of the masonic, and one of the typical double-heart form. (Plate xxvii, Figs. 13-17). The last is apparently a silver brooch used as a pattern on account of a crack, which put an end to its value as an ornament. The others are

made of zinc, especially for patterns, and show careful workmanship. In appearance they differ from a brooch in having no tongue and in the comparative roughness of some of them. Both curved (Plate XXVII, Figs. 5, 6) and straight chisels are especially well represented in the Society's collection. Besides larger tools already mentioned, there are many odds and ends which the Museum's outfit lacks, such as specimens showing the making of hollow beads, etc., with the die-plate and stamp (Plate XXVII, Fig. 9), a bit of colored glass for setting in an ear-ornament (Plate XXVII, Fig. 8), some rosin for soldering, etc.

The description of the manufacture of silver ornaments presented here was derived from actual observation of some processes, and from descriptions of others furnished by the chief himself. It is not claimed that these are the only methods used by Iroquois silversmiths; but Chief Joe assures me that they were commonly employed by him and by his grandfather before him.

Brooches were usually made out of coins. A coin of proper size having been secured (in this case a Canadian dime), the chief laid it upon the anvil and carefully beat it with a heavy hammer (in this instance a common claw-hammer, because the original was mislaid) until its diameter was increased nearly an inch and its thickness reduced to little more than that desired for the finished brooch. During the process, he took care to keep the pounding evenly distributed and the blank of uniform thickness. The metal was pounded cold, without even annealing. To illustrate this process, I secured a coin pounded out to the proper thickness (Plate XXIII, Fig. 6) for a brooch, and two pieces of a silver spoon thinned out by hammering, to be cut into wires for brooch-tongues and ear-ring loops. The pounding finished, the next task was to smooth the face of the blank with a file, and lay it off along the lines of the future brooch. Chief Joe had planned for a star brooch in this instance, and to this end had made a tin pattern (Plate XXIII, Fig. 27) of approximately the shape and size that he wished for the completed ornament. "We always cut patterns of tin or something cheap," he said, "for all the different kinds of brooches and crosses we want to make." Laying this pattern where he could see it, he perforated the centre of the blank with one of the awls. Then using the pincers as dividers, holding their jaws apart with one of the chisels, he laid off a circle to mark out the central opening of the brooch, the tip of the pincers making distinct scratches. The coin before mentioned, in the Museum collection, has a circle laid off by this means. The points about the periphery, where the rays of the star were to terminate in bosses, were then marked out and the arms themselves indicated. When a good pattern was available, the procedure was somewhat different. Instead of laboriously drawing circles with pincers, and

outlining other features freehand, the pattern was laid directly upon the blank, and its outline followed and marked into the silver with an awl or other pointed instrument. The next process was to make the bosses. This was done by laying the edge of the blank over the smallest hole on the die-plate, and forcing the metal into it with the appropriate stamp driven home by a sharp blow of the hammer. (Plates XXVIII and XXIX). This made neat and uniform bosses. The lines made in laying out the brooch were then followed with curved and straight chisels, and the surplus metal cut away, leaving the star brooch nearly completed. During the whole cutting-process, the blank lay upon the anvil. The next step was to smooth and trim the edges with a file, then to decorate the surface of the brooch. The second unfinished brooch in the collection illustrates this stage (Plate XXIII, Fig. 12). The so-called engraving was done more by stamping than by cutting, although no regular form of stamp was used. The straight chisel, lightly tapped, made a fairly long straight line. Round and triangular dots were formed by implements whose points had been filed into shape for the purpose. Curved lines and ovals were made by combining the imprints of curved-edge chisels; while short straight lines were the imprints of the chisel-like gravers. Two or more such graver-strokes made crosses. The most important use of the gravers, however, lay in making the zigzag lines, frequently of extreme delicacy and fineness, which form some of the most striking and artistic patterns found on the Iroquois ornaments. In this case the graver is not struck with the hammer, but is pressed firmly against the silver, and pushed forward with a strutting motion; the hand holding the graver moving from side to side the while. It is remarkable to note the skill with which this instrument is guided. As might be expected, the small zigzags are produced with a fine graver, the larger with a graver of broader edge.

When the brooch had been engraved, the next step was to perforate (with an awl) a small hole near the edge of the central opening to receive the hinge-end of the tongue. To make the tongue, a slender strip or wire was cut with the straight chisel from a larger piece of silver, as is shown by the hammered spoon-handle mentioned before, and this was filed and bent into proper shape, and put into place. The brooch was then completed.

As before intimated, the convex hollow circle of the simple-disk brooch was made by driving the edge of a flat disk of silver into the circular groove of the specially made die-plate by repeated strokes of a suitable punch (Plate XXV, Figs. 1, 2), thus forming an embossed circle. The metal within the circle was then cut out and the edges trimmed, when the ornament needed only polishing and a tongue to be complete. An unfinished brooch of this kind is shown in Plate XXIII, Fig. 17.

Making ear-ornaments was more difficult, because these often required hollow drops and pendants, and sometimes settings of colored glass, as well as a hinged wire loop to go through the ear. Of course, in the plain hoop ear-rings these difficulties did not appear. The silver was hammered out, marked off, and cut in approximately the same way as for brooches. For the hemispherical or chestnut ear-drops (the most common shape), two circular pieces of silver were cut out, one larger than the other. The latter was laid over the largest hole in the die-plate, and driven in with the proper punch and a hammer until it formed a hollow hemisphere. When the edge had been filed, the opening was closed with the flat circular disk, and the two soldered together. This was effected by placing between them a few bits of lead, and holding them over the flame of the lamp by means of the pincers, turning them as the lead melted. The pear-shaped pendants were also hollow, and prepared in two parts (equal this time), and pressed into form in a pear-shaped die (missing from our set) with the pear-shaped stamp. Most of the hollow ear-drops exhibit decorative engraved patterns, while the pendants show designs formed by grooves in the metal. When I asked Chief Joe how these were made, his answer, as nearly as I could understand it, was to the effect that the decoration on the drops was made with a file and small punch after the pressing was done, but that, with regard to the pendants, the dies and stamps were themselves engraved with the patterns beforehand, which were thus consequently communicated to the silver. The part concerning the ear-drops is evidently true; but, on thinking it over, I have come to the conclusion, that as all the dies and stamps I have seen have been plain, and all the hollow ear-pendants decorated, he must have meant that the patterns were stamped into the silver before the metal was pressed into form. The setting of ear-drops and pendants with pieces of colored glass was effected by first cutting a long flat strip of silver with a series of equal projecting points along one side; then this was bent into the form of the setting, and soldered fast, on edge, upon the face of the ear-drop; the points, of course, being upward. When the glass had been inserted, the points were bent down, holding it firmly. Sometimes an embossed sheet of silver, cut to proper form, was placed beneath the glass, so that the patterns would show through. The glass was shaped with a file. The wires intended to pass through the ear-lobes were, like the tongues of the brooches, first cut with a straight chisel from a large piece of hammered silver; and there were four pieces in all, two for each ear. The ends of two of these short wires were split with the straight chisel, and spread with the spreader before mentioned. The ends of the other two were then filed into tongues, fitted into the splits, and riveted fast, forming hinges. There were now two wires, which were filed round and smooth, then bent carefully

and slowly with the aid of the pincers into a C-shape, one end of which was soldered upon the lower edge of the back of the ear-drop, the other fitted into a little hole or socket near the upper edge, as shown in Fig. 2. This held the ornament secure when in use.

Head-bands and armlets required another process, casting, which was accomplished in a simple and, to my mind, ingenious way by means of the hardwood moulds previously described. When in use, the trough of the mould was filled with glowing hardwood coals upon which were distributed bits of silver in sufficient quantity to fill the mould when melted. Then the wooden blowpipe came into play; and the coals, by steady blowing, glowed with so much heat that the silver melted, and ran down into the mould below. Sometimes, in order to get the metal into such shape that it would be evenly distributed, it was necessary to cast a number of small bars in the small mould, and then cut them up to be laid upon the coals of one of the large ones. The bar, once cast, was carefully hammered thin, growing larger and broader with every stroke until the proper dimensions were reached. It was then filed smooth, laid off, fluted, cut, and engraved in much the same manner as a brooch. Frequently the head-bands show the art of the Iroquois silversmith at its best. Everything is dainty, symmetrical, artistically planned, practically perfect. The fluting was done with a wide chisel whose edge had been purposely blunted and rounded.

Chief Joe did not mention finger-rings; but these were apparently often made in two pieces, which we may call the band and the seal. These were soldered together after being cut out, decorated, and bent by processes before described. As before mentioned, some rings were plain bands. Others had no seals attached separately; but the band was broadened and decorated at some one point, producing the same effect.

Before concluding, a few words concerning the origin of the art of silversmithing among the Iroquois may not be out of place. Of course, such a discussion must necessarily be almost entirely theoretical. Taking the brooches first, it seems possible that we may look for their ultimate origin in the ornaments of copper, mica, and other materials thought to have been sewed or tied upon garments as ornaments by many tribes of the precolonial period. As Beauchamp says, "Apparently the brooch was an evolution from the gorget, for some (early) ornaments of this kind were tied on, not buckled." He mentions and figures such a crude brooch-like ornament of copper found on an Onondaga site of 1677.¹ It is difficult to surmise how the buckle-tongue fastening originated, or, if borrowed, whence it came.

¹ Beauchamp, *Metallic Ornaments of the New York Indians*, p. 77. Moore found brooch-like gorgets of copper in prehistoric Alabama mounds (Moore, *Certain Aboriginal Remains of the Black Warrior River*, pp. 198, 219).

Perhaps the idea was in some way derived from the old-fashioned shoe or belt buckles of the colonists. Examining the patterns, the Masonic type speaks for itself, as being clearly of European origin; but the other forms are not so easily traced. The heart-type, surmounted by an apparent crown, looks suspiciously European also; but we cannot prove that the heart, which occurs so often in all kinds of Iroquois carving and beadwork, is not a pattern native to the people. The crown-shaped ornament above possibly represents a feathered head-dress, or sometimes an owl's head.

As for the star-form, we can find similar many-rayed designs on the painted robes of the Plains Indians. Squier¹ reports an ornament in the shape of a four-pointed star, made of copper and shell wrapped in thin beaten silver, found in a prehistoric mound at Mound City, O. It is not even necessary to suppose that the silver head-bands of the Iroquois were copies of the royal crowns of England or France. Granted that the Indians could invent a star-shaped brooch whose rays terminate in bosses, they would very naturally cut the top of the silver head-band into similar ornamental rays. Still the resemblance to a crown is at least a remarkable coincidence.

In form and especially detail, the ear-ornaments show considerable originality; but in the hinged wire loops for attachment to the ear we see a European invention. Italian women on the streets of New York to-day wear ear-rings fastened in the same identical fashion. The custom of wearing metallic ear-ornaments is, however, of by no means recent origin in North America. The so-called "mound-builders" wore spool-shaped ear-plugs of copper, often coated with thin hammered silver. Squier quotes an account of the Virginia Indians of the sixteenth century,² in which an explorer reports that he saw "two small pieces of silver grossly beaten, hanging from the ears of a Wiroance." Turning to the decoration, we see that one ear-ring pattern, the spread eagle with scroll and shield, is plainly derived from that stamped on United States coins; yet I have seen hawk and other bird patterns that were not necessarily borrowed. The finger-ring is probably a relic of Jesuit influence, as are the silver crosses occasionally seen. Arm-bands are probably of ancient origin, at least in idea.

As for the art as a whole, its origin is not made clearer by what can be learned from observations on different ornaments themselves and their possible beginnings. We know that several prehistoric Indian peoples in the eastern part of North America were experts at hammering copper, embossing, engraving, and excising the metal much as the Iroquois do silver; and it is reported that they sometimes used silver also. Some of their products will bear favorable comparison with the best works of Iroquois silver-

¹ Squier, *Antiquities of the State of New York*, p. 291.

² Heriots Voyages, 1586, in Pinkerton, Vol. XII, p. 574.

smiths, with all the latter's modern tools. There are even spread-eagle and brooch-like patterns found on copper plates in the mounds¹ in such widely separated localities as Georgia and Illinois. Thomas, however, thinks these copper ornaments were probably made with European tools or by Europeans, simply on the ground that they are too good to be the work of a stone-age people. But other authorities, such as Putnam and Saville, disagree with him; and the inimitable Cushing² clinched the matter by reproducing the ornaments, with all their embossing and open-work, from a nugget of copper with stone and bone implements only. The simple and ingenious methods by which these results were obtained he learned from the Zuñi Indians.

I think I have made it clear that it is, then, not necessary to look outside of America for the mother of the Iroquois art of silversmithing. It is also plain that European influence was very powerful both at its birth and during its development. In fact, if we call the ancient American hammering of metal the mother of this art, we can say that its father came from across the ocean. Nevertheless, it has acquired a character all its own, and bears the impress, not only of the adaptability of the Iroquois, but of his originality. In this light we may consider it worthy of study.

In conclusion, a partial list suggesting the wide distribution of silver ornaments among the Indians may prove of interest. No attempt has been made at completeness, the data being only such as have come to my notice. To my personal knowledge, silver ornaments have been made by the following tribes: Oneida, Onondaga, Cayuga, Seneca, Delaware, eastern Ojibwa, Seminole of Florida, Chotaw of Mississippi, and Koasati of Louisiana. The silversmith's art of the Navajo and some tribes of the northwest coast is, of course, well known. Among the other tribes from whom silver ornaments have been reported are the Tuscarora, Mohawk, Cherokee, Mohegan, Penobscot, Miemac, Sac and Fox, Dakota, Pawnee, Osage, Acoma, Apache, Yuchi, Creek (other than Koasati), and Chitimacha.³ It is not certain whether all of these tribes manufacture such articles, but the probabilities are that many of them do so. Most tribes addicted to silver ornaments use some of white man's make, and some obtained from other tribes in addition to those of home manufacture.

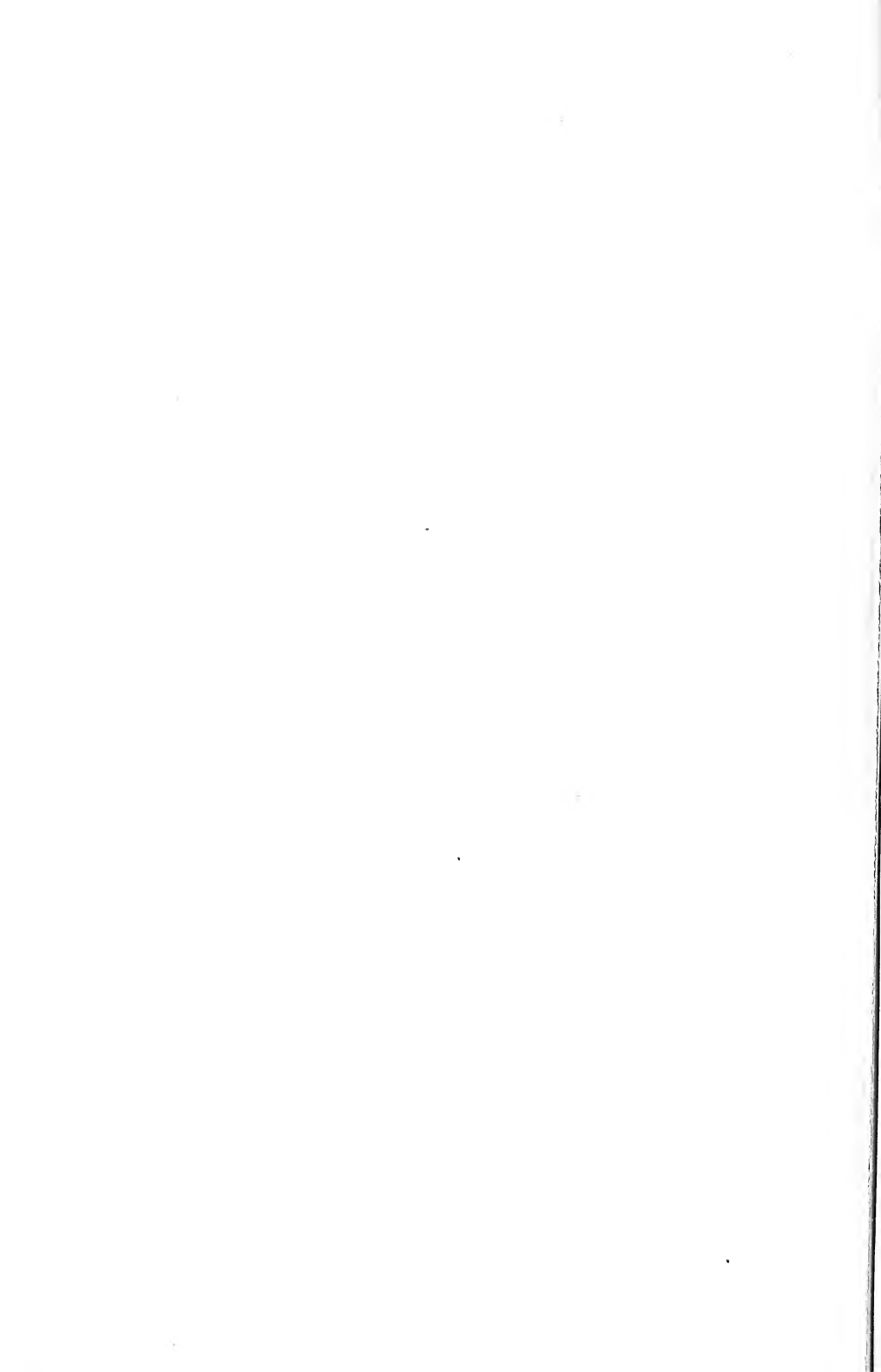
Further investigation of the distribution and character of Indian silversmithing might lead to interesting results regarding the origin and dissemination of that art. I suspect that the southeast might furnish the connecting

¹ Thomas, *Mound Explorations* (12th Annual Report of the Bureau of Ethnology), Plate XVII, and Fig. 192.

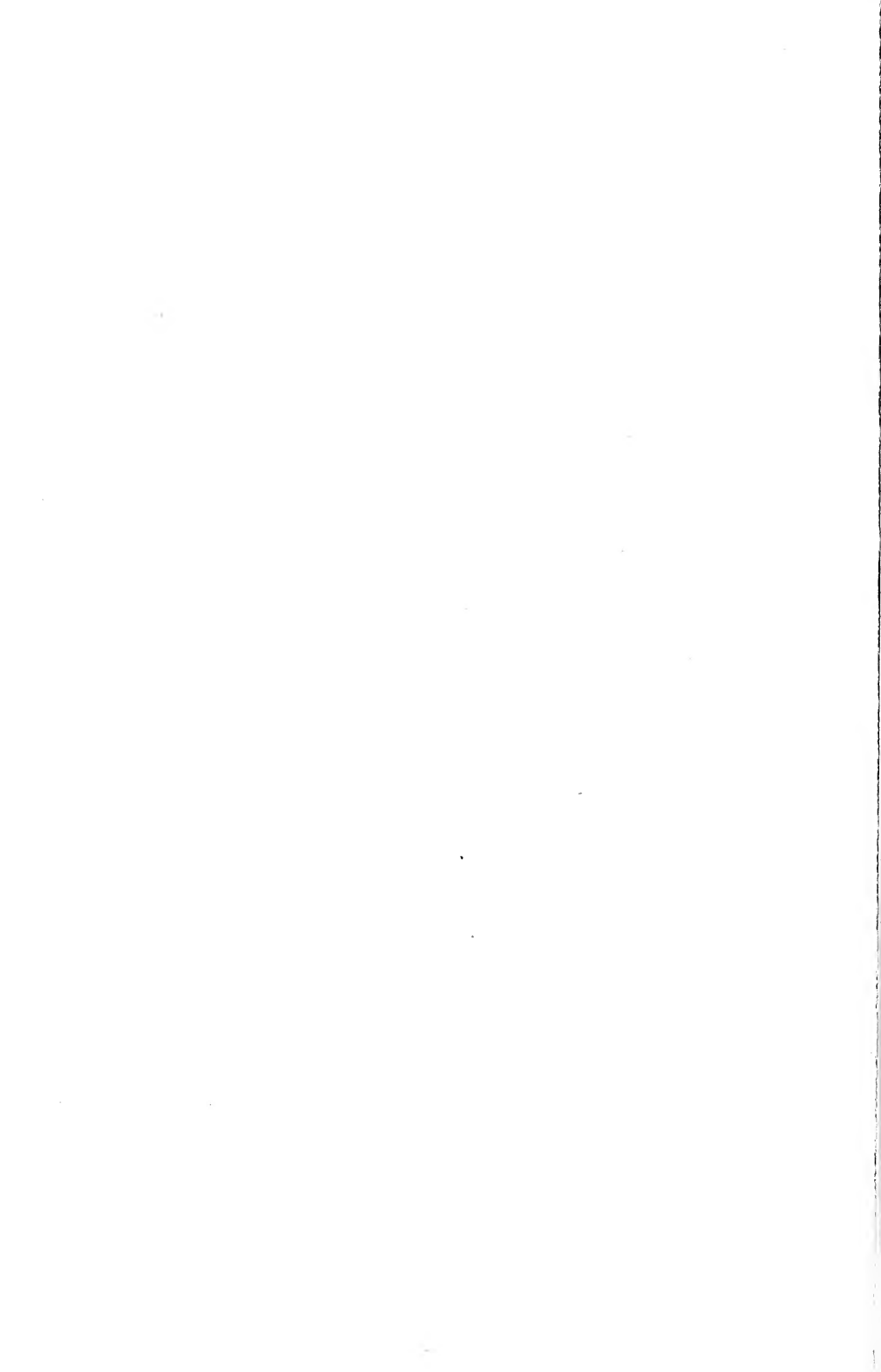
² Cushing, *Primitive Copper Working* (*American Anthropologist*, January, 1894).

³ The Museum collections contain silver ornaments from the Dakota, Pawnee, Fox, Ojibwa, and Delaware Indians in addition to those of Iroquois origin. For Dakota designs on silver, see this publication, Vol. I, Part II, pp. 44, 52.

link between the metal-working of historic and prehistoric times; for many of the silver brooches and pendants of the Seminole and other Muskhogean peoples present a strong similarity to the prehistoric ornaments of copper found by Moore in the mounds of the region formerly their home.









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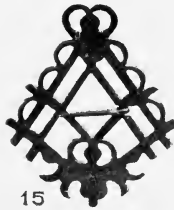
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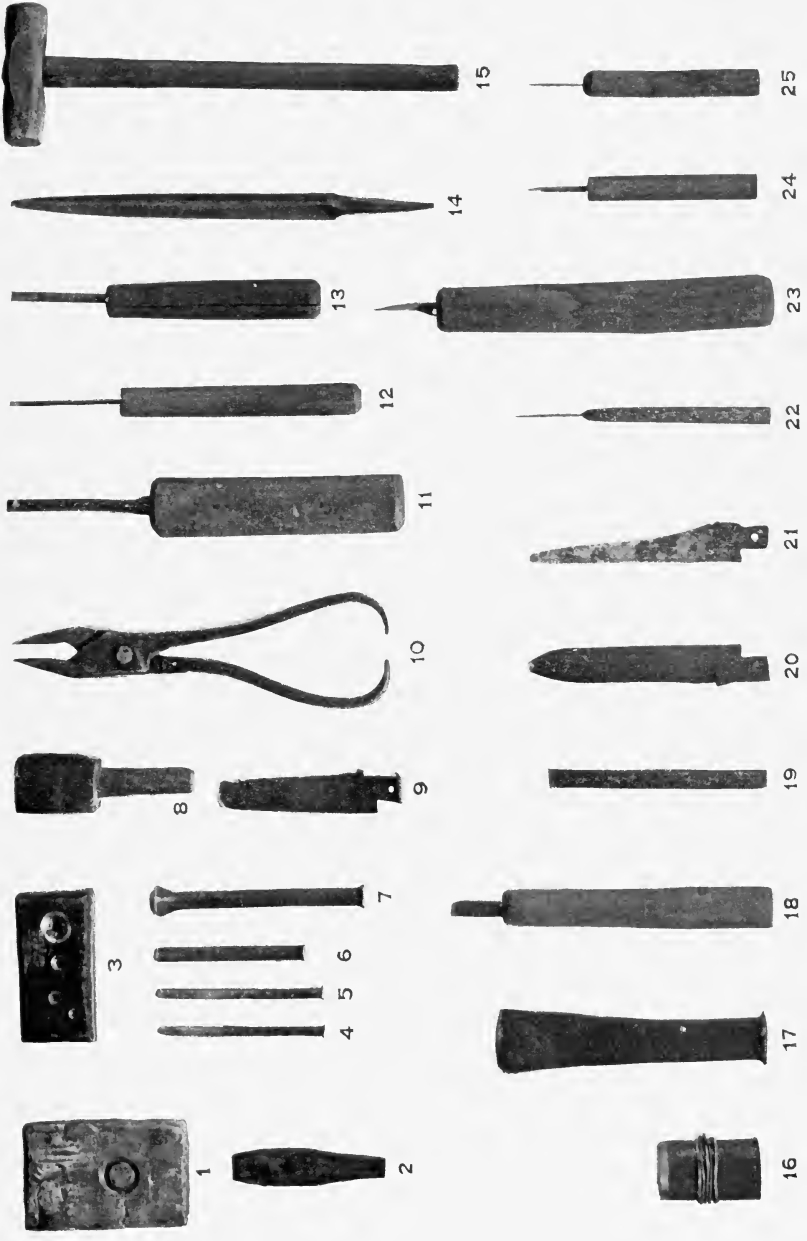


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BROOCHES, RINGS AND EAR-RINGS.



HEAD-DRESS AND BRACELETS



SILVERSMITH'S TOOLS.



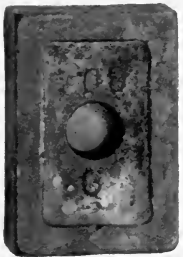
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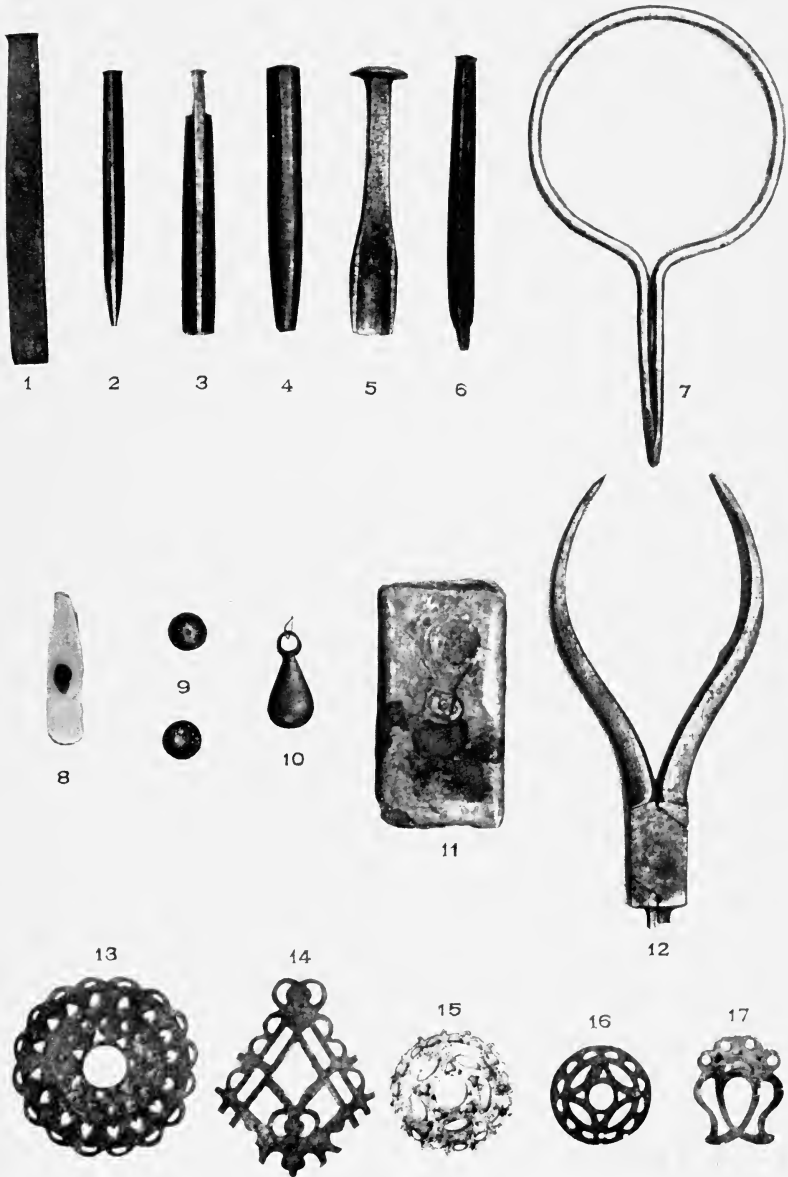
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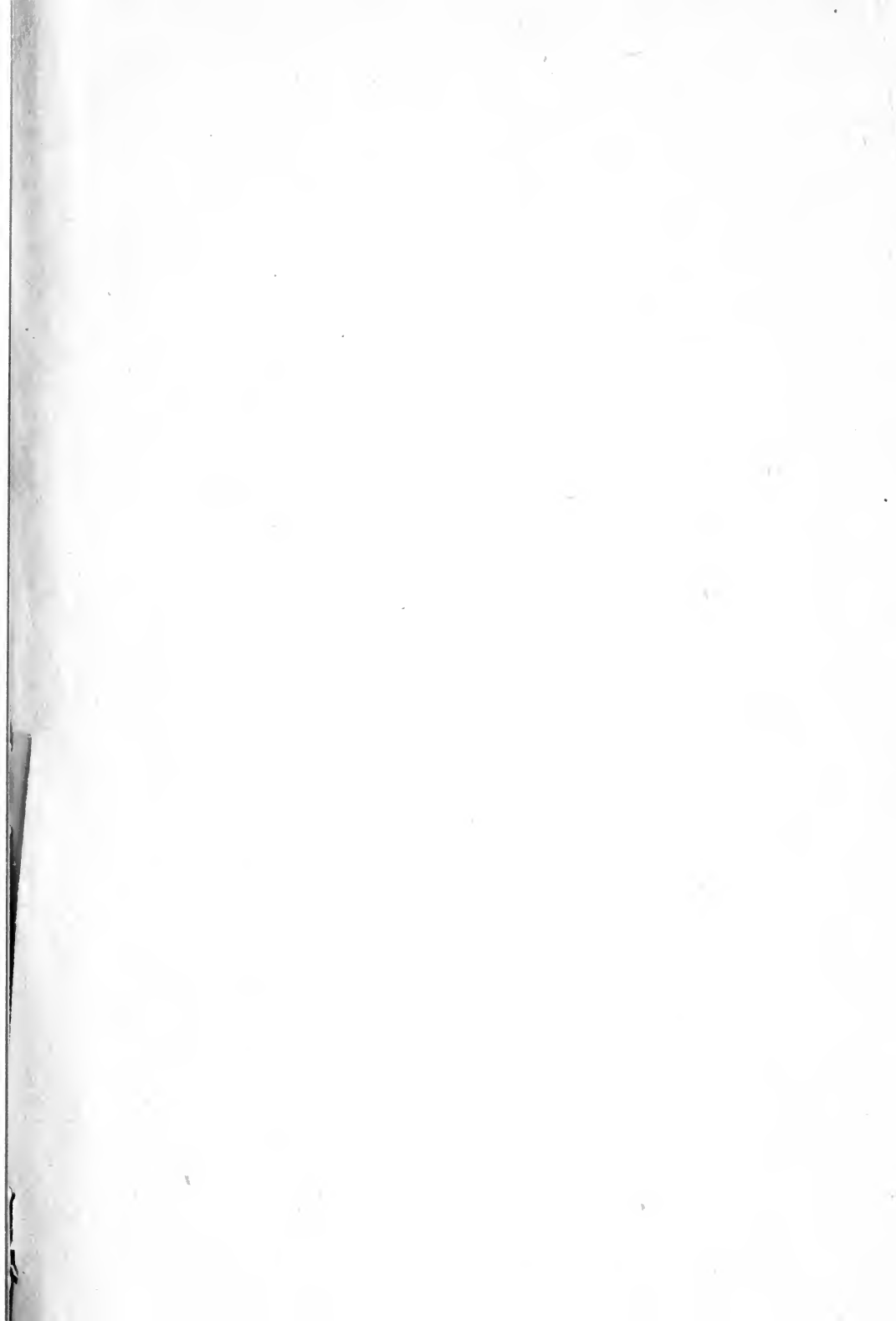


HAMMERING OUT A COIN.

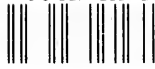


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