19. RECOVERING THE TINSMITH'S ART

Tin artifacts are among the most fragile items from the site, but substantially perfect replicas can be copied from the scraps, using historic craft skills.

Because they are subject to degradation in the ground, metal artifacts pose special challenges to both the interpreter and the conservator. Each metallic element and alloy has its peculiar characteristics, complicated when metals and other materials are combined in a single artifact.

Metal artifacts seldom contain a single material. Tinplate is a combination of sheet iron, tin plate, lead-based solder, and sometimes painted decoration and lacquer protectant. Knives and forks typically consist of a metal instrument riveted to a bone handle, sometimes with inlays of a second or third metal.

Each of these components requires different techniques for conservation cleaning, and retention, which makes the curatorial task almost impossibly complex. Because all the different parts tend to reach chemicaly with one another, mixed metal artifacts frequently are found in extremely fragile and deteriorated condition. Tinplate is among the worst preservation nightmares in archæology, and it becomes more and more frequent in newer sites. Its relative rarity in eighteenth-century Delaware is reflected in the rough census of metal vessels on page 273.

Plate 58
Richard Haddick examines tin remains

Interpretation and curation of metals is among the most difficult assignments in archaeology. Iron objects are most frequently reduced to blobs of rust, which sometimes displaces all the metal inside. Tinplate frequently is found in fragmentary condition, smashed and unrecognizable without detailed analysis.

TINPLATE ARTIFACTS

Tinplating originated in Bohemia in the middle ages. By the seventeenth century, tinware was a popular cheap substitute for pewter throughout Europe (Brown 1988). The English tinplate industry began in 1667 when Andrew Yarranton led a party of industrial spies to visit plate mills in Saxony, where they learned the process. For the rest of the century, various entrepreneurs attempted to get the English tinplate industry under way.

Finally, in 1697, the first English rolling mill at Pontypool began producing a uniform and thin iron plate that was well suited to tinplating. A few years later, they added a plating shop and the English tinplate industry was under way. The industry spread to other parts of the West Midlands and South Wales within a very few years.

Up to 1740, the small amount of tinware used in America was imported from England. After 1750, tinwares manufactured in Connecticut from English plate were distributed throughout America. By the end of the century, a native American tinware industry had developed and the industry was becoming mechanized (Mulholland 1981:96).

Replication is a time-honored method for analysing archæological tinware. Tinplate recoverd from archæological sites frequently is smashed and distorted when it is removed from the ground. To the untrained eye, the typical tinplate artifact is nondescript.

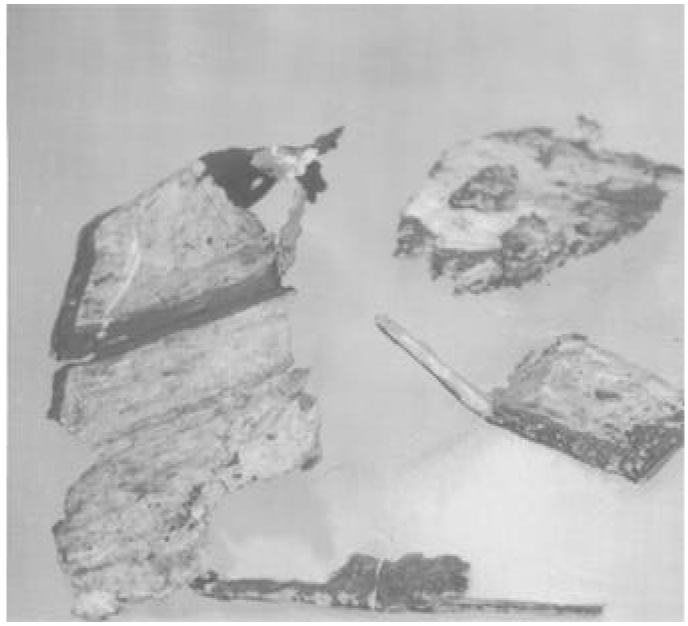


Plate 59

Tinplate scrap that was once parts of a basin

At Fort Ligonier, Pennsylvania, replication was used effectively to reconstruct the shapes and construction methods of smashed cups and buckets (Grimm 1970: 168-169).

A replicator not only reproduces the shape of the artifact in its original state, but can interpret the technology of its maker. Knowing the historical maker's level of skill, , technological awareness, and attention to style, can help interpret the cultural context of the site.

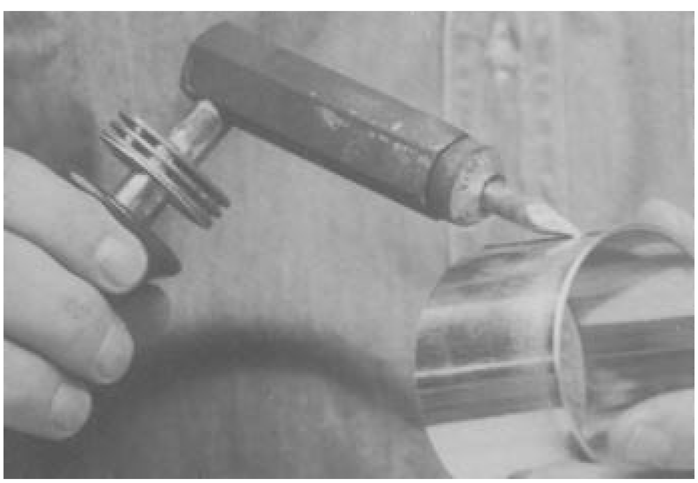


Plate 60

Soldering the seam on a cup with a modern iron

The east well at Bloomsbury yielded two moderately well preserved tin cups and some flattened tin. A wire bail handle (Figure 94, page 239) appeared to belong with the tinware. As the pieces of tin were sorted, it became apparent that the flattened tin included a damaged bottom and part of a side of a tapered vessel.

The cups and fragments were taken to Richard Haddick, a historical tinsmith in Wyoming, Delaware, for interpretation and replication. Haddick concluded that there were three fully reproduceable vessels: two cups and a basin. As nearly as possible, the construction methods of the eighteenth-century originals were duplicated, using hot-dipped tinplate of the type that was available to the original maker.

The sheet was cut to 10” by 14”, the size shipped by English makers to the American market (Audels 1962). Other standard English sheets of the period were 13 3/4” by 10” and 16 1/4” by 12 1/2” (DeVoe 1981:9). These sheet sizes were inexact by modern standards. In 1780, the organized Cornish tinplate sheet manufacturers standard-ized the two principal sizes of plate in terms of ranges of dimensions:

Singles: 12 3/4” by 9 1/2” to 13 3/4” by 10”

Doubles: 15” by 11” to 16 3/4” by 12 1/2”

“Doubles” plate was heavier, and was used for larger products. Cornish tinplate was shipped thereafter in boxes of 225 sheets (Phil Kelley personal communication). The 10" by 14" sheet has exerted a longstanding hold on tinware design. Alongside plans for air-conditioner ductwork and refrigerator pans,

Plate 61

Cup side cylinder reconstructed

Plate 62

Tin cups, as found

the Audel sheet-metal manual published in 1962includes plans for vessels identical to the eighteenth-century originals. Using the manual and the specimens, Haddick was able to reconstruct the original three vessels, a basin and two drinking cups.

The smaller drinking vessel was a cup with a 9” circumferance and $2^{7}/_{8}$” diameter. The finish height is 2”. No handle survived, but solder encrustations provided dimensions and locations for the handles of both cups. The edge was rolled over 18-gauge wire.

With allowances for overlaps, Haddick cut a side piece $2^{7}/_{32}$” by $9^{1}/_{4}$” and a circular bottom $3^{3}/_{16}$” in diameter. He used a burring machine to embed the wire in the edge before forming the cylinder. Because the side seam overlaps, the wire edge is shorter than the whole sheet. A notch in one upper corner of the sheet accommodated this difference.
The side was then rolled into a cylindrical shape and its bottom edge was turned out on the burring machine. A simple soldered lap joint formed the cylinder. During the eighteenth century this operation would have been done with hand tools. The bottom was then turned up. For this process,

Haddick used a burring machine, which was introduced early in the nineteenth century. The disk was snapped over the cylinder and then the lip was turned down to lock the bottom.

While it might have been watertight with only a locked joint, it had been soldered. Using 50/50 solder, Haddick made a sweat joint from the inside of the vessel. Entry and exit points of the soldering iron are visible on both the original and the replica. Haddick noted that the original maker probably was right-handed, judging from the direction of the lap joint.

Using solder joint remnants as a guide, Haddick made a handle with a finished width at the bottom of $^{3}/_{8}$” and $^{3}/_{4}$” at the top. The length of the handle blank was the same as the height of the side blank, $2^{7}/_{32}$”, since a piece of this size would have been left over if the side of the cup had been cut from a piece of tin 10” wide. The handle was hemmed and then butt soldered to the cup along its seam. The butt solder joints would have been a weak spot in the design, and may explain why no handle was found with either cup.

Capacity is about 200 cc, or three quarters of a modern measuring cup. The replica cup is remarkably similar to the one illustrated in the 1962 Audel manual, reproduced below.

Elapsed time to make the cup was about an hour. In the mid-nineteenth-century, such a cup would sell for 6¢.

The second cup, with a capacity of about a pint, was made the same way, probably by the same tinsmith. It is 4” in diameter, 3” tall, and $12^{1}/_{2}$” in circumference. The disk for the bottom was originally $4^{1}/_{2}$” in diameter. The blank for the side was $3^{7}/_{32}$” by $12^{3}/_{4}$”. Haddick noted that it had been roughly used

Plate 63

Tin cups, as reconstructed by Richard Haddick

Plate 64

The reproduced tin basin

Haddick's reproduction of the tin basin faithfully follows the materials found in the well, and conforms to the measurements given in the Audel manual, below.

before being The handle is 1" wide at the top and $^{5}/_{8}$" at the bottom, also with butt joints. The base is soldered inside and outside, as opposed to the inside-only soldering of the smaller cup.

The two replicated tinplate cups based on specimens found at the French and Indian War Fort Ligonier were 3" high and 5.1" high respectively. Tinware was not uncommon in the fort (Grimm 1970: 168, 151).

Uncannily close to the Audel's manual was the tapered two-quart basin. The two pieces for the side of the basin fit comfortably in the 10" by 14" sheet size. The basin tapers from $6^{1}/_{4}$" on the bottom to $8^{1}/_{2}$" at the top. Once a sheet metal pattern had

been made, the tapered basin went together almost as quickly as the smaller cups. The bottom seam of the original had not survived, but Haddick soldered it inside and out, in order to ensure that it would hold water under rough use.

Also in the same part of the well, but fragmented beyond recognition, were pieces of a tinware vessel with a locked seam. Haddick explained that locked seams can be used on a vessel that would be heated, since it did not require solder. A soldered lap seam, such as on the cups and basin, might come apart if heated without containing a liquid. Coffee pots and kettles, for example, would be jointed without solder.

SCHEDULE FOR HAND MADE TINWARE

From *Sheet Metal Pattern Layouts*, Theo Audel & Co., 1962, pages 343-345, 377

It would seem, perhaps, that the use of hand made tinware was practically obsolete, since it has become so largely replaced to-day by machine made stamped goods. And yet the fact that there is, and probably always will be, more or less demand for this class of goods, especially in jobbing shops and the more remote country shops, shows the importance of knowing something of the sizes and dimensions of these articles.

The advantage of the schedules in vogue before the advent of machine made goods lies in the fact that they were gotten up with a special view of working material to the best advantage with the least possible waste. Another consideration would seem to make the publication of these old but reliable schedules desirable and important is the fact that "old Father Time" is fast thinning the ranks of the "all around mechanic," and the field will soon be left to our young men growing up in the trade. If they understand the old and well tried methods of getting out the work, they will become better and more thorough mechanics, and hence more serviceable to their employers.

Schedule of Dimensions of 1-Pint, 3-Pint and 2-Quart Tin Basins.

	Dimensions in inches			
		Depth on	*Diameter*	
Size	*Depth*	*Flare*	*Top*	*Bottom*
1-pint	$2\,^{1}/_{4}$	$2\,^{3}/_{8}$	$5\,^{3}/_{4}$	$4\,^{1}/_{8}$
3-pint	$2\,^{1}/_{2}$	$2\,^{5}/_{8}$	8	$6\,^{3}/_{8}$
2-quart	$3\,^{15}/_{32}$	$3\,^{5}/_{8}$	$8\,^{1}/_{2}$	$6\,^{1}/_{4}$

One-Pint Basin. The body made of two pieces, out of 10 X 14 tin.
Three-Pint Basin. The body made in three pieces, cut out of 10 X 14 tin. Two pieces cut out of the width of the sheet 10 inches, and one piece one-half the long way of the sheet, or 7 inches.

Fig. 1 A Tin Cup

Two-Quart Basin. The body made in two pieces, out of a 10 X 14 sheet of tin and cut lengthways of the sheet.

PATTERNS FOR A DRINKING CUP

There are many simple articles that can be made by the apprentice in the tin shop, with the ordinary tools. One of these is a plain drinking cup, such as is shown in Fig.1. usually made from IC bright tin with a wire or hem edge at A.

The bottom has a single edge and is soldered on the inside when hand made. Fig. 2 shows the three patterns for the cup. The pattern A, for the body, is cut on the squaring shears, of the required

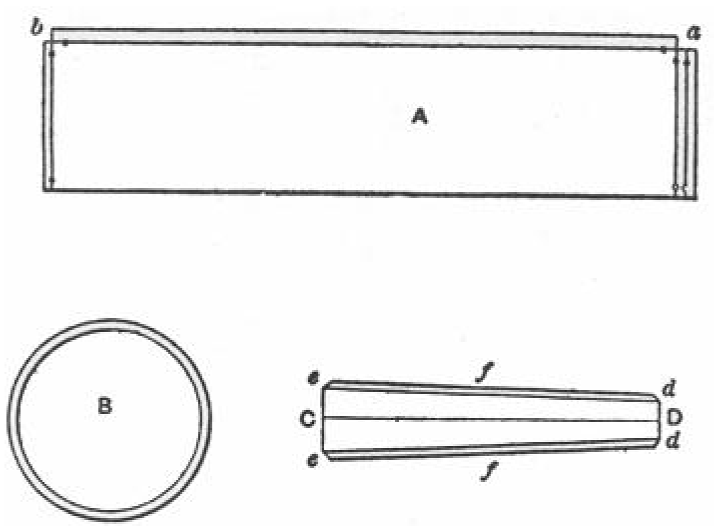
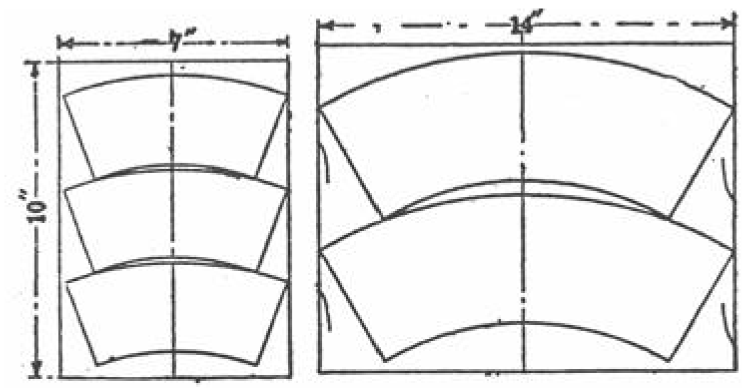


Fig. 2 The Patterns for the Cup

height and in length equal to the circumference of the bottom, B. If the seam in the body is soldered, then only a single edge is necessary, as shown at *b*. If the seam is grooved, edges are allowed, as shown at *a* and *b*. Should a wire or hem edge be allowed along the top of the cup, it should be notched at the corners, as shown. B shows the bottom with a single edge at *c*, while C D is the pattern for the handle, which is obtained by making C D equal to the length, and *d d* and *e e* equal to the top and bottom widths. The hem edges *f* and *f* are added. The body, A, is edged and wired, then rolled, the edge turned on the bottom B and then soldered to the body.

The handle, C D, is then edged, formed to the required shape and soldered to the cup.



TIN BASINS

The sizes and dimensions of basins presented on page 343 have long been the standard. This scheule in former years had a special value, because of the fact that such articles of tinware, as well as nearly all others, were made in larger quantities, such as gross lots, and the sizes of patterns were so proportioned as to cut stock to the best advantage with the least possible waste. In the illustrations herewith, it has been aimed to show how this is accomplished with the least possible expense under the old regime of hand made tinware, as well as giving the required size of the various patterns.