# 15. TRADE ARTIFACT ANALYSIS

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## Introduction

The purpose of this chapter is to describe and discuss variation within and the significance of small collections of glass trade beads and trade metal artifacts recovered in the 1998 excavations at Scattered Village. These artifact samples are particularly significant, for comparative purposes, because the village occupation dates at the very beginning of the period of recognizable influence from contact between Native Americans and Europeans. Consequently, the specimens described herein reflect some the very earliest Euroamerican items to reach the Northern Plains, at the heart of the continental interior. These specimens almost certainly reached Scattered Village by processes of indirect exchange, passing through the hands of multiple Native American communities, with initial exchange occurring at contact points with Euroamericans several hundred kilometers to the east.

Based on the assessment of early contact chronology at several stratified Hidatsa sites at the Knife River (Ahler and Drybred 1993:390), in villages where occupations began at about the time of first contact (Big Hidatsa Village) or where continuous occupation crosses this temporal boundary (Lower Hidatsa), we estimate that the time of first appearance of Euroamerican items occurred at about AD 1600. Several large excavated contexts at Scattered Village lack trade artifacts, indicating that they probably date just before AD 1600. A greater number of excavated contexts have trade artifacts in very low frequencies, indicating that they postdate AD 1600 by a few years. On this basis, we have estimated that the entire occupation sequence at Scattered Village falls within the period AD 1550-1700. It may be even a little shorter than this, as four metal-modified bone specimens were found in contexts lacking trade specimens, indicating that yet more of the excavated contexts within the site post-date the contact boundary (see Chapter 13).

The glass and metal artifacts described in this chapter were first examined during early stages of the project and were used to develop the chronological structure for the site based on relative densities of both metal and glass beads in diverse contexts (see Chapter 5). That study was necessary to develop the analytic structure that all analysts required for their respective studies of chronological change within particular industries and assemblages. The more detailed analysis reported here was conducted some 15 months later, near the very end of the project, and for that reason there are minor discrepancies in the data reported in Chapter 5 and reported here. These variations do not affect the basic chronological structure for the site as a whole laid out in Chapter 5, nor any other broad comparisons between Scattered Village and other sites.

## Glass Beads

The study of glass trade beads from the site has gone through several iterations. Glass beads were isolated during the collection sorting and sample processing steps, and these beads were examined and inventoried (but not analyzed) as part of a general inventory of both historic and trade items that was used to assess degree of disturbance as well as relative chronology within the site. That inventory process is discussed in detail in Chapter 5, and the counts of glass beads developed in that inventory are enumerated in several tables in that chapter. Much later, the glass bead assemblage was analyzed in detail by Chad Badorek, who was at the time also studying, coding, and writing up portions of several much larger glass bead collections from Fort Clark Historic Site. During this period, we also took the Scattered Village bead assemblage to the Plains-Midwest Conference held in November 2000 in St. Paul, Minnesota, so that they could be examined by others in the context of a workshop on trade beads. Finally, after Chad's analysis and coding of the collection, we sent the entire assemblage to Dr. William Billeck at the Smithsonian Institution for his examination. Bill is in the process of studying many bead collections from postcontact Coalescent tradition sites (mostly Arikara sites in South Dakota), and he was particularly interested in seeing these materials as an example of very early contact period beads in the Northern Plains. Bill subsequently provided useful comments on the collection, which we have taken into account in our final study. Therefore, the data set we work with here was developed by Chad Badorek, was modified slightly with some input from Billeck, and was finalized and analyzed by Ahler. Ahler wrote the majority of this chapter, with Badorek contributing much of the section on bead study methodology.

**Methods**

Ahler and Drybred (1993) studied a large sample of glass beads from several village contexts in the Knife region using an attribute-based rather than any of the type/variety-based approaches more common in bead studies. Their study took into account the size distribution of all beads, and then dealt with the variables or attributes: manufacturing technique, structural complexity, shape, and color for only small and very small beads (< 4.0 mm diameter). Working with samples from several sites and components dating from AD 1600 into the 1800s, Ahler and Drybred (1993) demonstrated substantial temporal changes in mean bead size, complexity, color, and color heterogeneity. Many of these changes were operative well into the AD 1800s. Because of the success of that approach, an analytic methodology that explicitly recorded bead attributes was deemed useful for the present study. As noted, the Knife River study focused only on beads in the small and very small size classes, and did not deal with beads larger than 4.0 mm in diameter. The analytic system we use here incorporates all of the data in the Ahler and Drybred methodology, and also is applied to beads in all size ranges.

More traditional approaches to bead analysis focus on type-variety classification systems, which are grounded in most of the same the attributes recorded by Ahler and Drybred, but which focus analytically on an almost limitless number of classes that may differ from one another by details as small as the diaphaneity of the glass within a single color class. Examples of such approaches occur in the Kidd and Kidd system (1983), intended for broad application to beads from many contexts, as well as in De Vore's (1992) and Ross' (2000) site-specific studies of beads from a single site – Fort Union, North Dakota. In order to accommodate comparisons of our results with those from typological approaches, we have noted where possible a cross-reference to the bead types used by De Vore and Ross where such could be determined for the Scattered Village specimens. Amazingly, the study by Ross (2000), while dealing with the same site as De Vore, develops a completely independent naming system for types and varieties from that used by De Vore, so it is necessary to reference both systems although they deal with beads from the same site.

Operationally, all of the beads from a given catalog number were sorted sequentially and hierarchically on a series of variables and attributes, as follows: size class, manufacturing technique, structure or structural complexity, shape, primary (outer) color and associated diaphaneity, secondary color (if present) and diaphaneity, and tertiary color (if present) and diaphaneity, and finally the De Vore code and the Ross code[1]. Sorted in this fashion, data for each bead or group of beads was recorded as a record of data in the database, while also recording the count of specimens with shared attributes under that catalog number. The coding and data recording system is presented in more detail in Table 15.1.

All glass beads analyzed in the present study were examined in a petri dish filled with water under strong light and magnification with a binocular microscope (7X-42X). Beads exhibiting a patina or encrustation that inhibited the identification of bead color and/or structure were lightly scratched in an area sufficiently large to facilitate better identification. No attempt was made to differentiate between bead fragments and whole beads in the quantification of bead varieties. We can provide a few additional comments regarding how variables were recorded.

*Size*

Glass beads were size-classified according to the Kidd and Kidd system (1983). This process involved first running the glass beads over two graduated series of screens (4 mm and 2 mm), resulting in beads grouped as follows: >4 mm; 2-4 mm (Kidd and Kidd's small); and <2 mm (Kidd and Kidd's very small). Those beads greater than 4 mm were further subdivided into three classes, very large (>10 mm), large (6-10 mm) and medium (4-6 mm) by measuring individual glass beads with calipers. Glass bead fragments were placed into the size class that most closely represented the inferred maximum diameter of a given bead fragment if the bead were complete.

*Manufacturing Technique (De Vore's Class)*

Six manufacturing techniques were considered for the present study (Table 15.1), although only the first two occur in the Scattered Village sample: drawn (De Vore's class I, or CI), wire-wound (CII), mold pressed (CIII), molded wire-wound (CIV), blown (CV), and hand-

[1] De Vore's codes have imbedded within them a hierarchically structured key that incorporates information of technique, structure, shape, color, and diaphaneity. Ross's bead types or varieties are based on the same series of variables, but are numbered in a random fashion, starting with 1 and continuing through 360+, as each new variety was discovered by lab workers. Thus, Ross varieties have no logical structure to their numbers, and are very difficult to use in a comparative fashion. Neither of these systems considers size to be a relevant attribute regarding typology. Bill Billeck (e-mail communication to S. Ahler, March 8, 2001) cautioned against using the De Vore and Ross codes developed for Fort Union for the Scattered Village specimens, because the two sites differ so greatly in time. However, because the codes, types, and varieties developed by these two workers are simply hierarchical intersects of several variables recognized by all bead analysts, this should present no problem. Ross and De Vore varieties that occur only late in time should not occur in the Scattered collection; varieties that have great time depth will occur in both collections. Cross-reference between the three systems should prove informative regarding isolation of bead varieties that have chronological meaning.

Table 15.1. Variables recorded in analysis of glass beads, Scattered Village (32MO31), 1998 excavations.

| | | | | |
|---|---|---|---|---|
| CATNO | | Catalog Number | | |
| SIZE | | Size Class | | |
| | 1 | Very Large (>10mm) | 4 | Small (2-4mm) |
| | 2 | Large (6-10mm) | 5 | Very Small (<2mm) |
| | 3 | Medium (4-6mm) | | |
| MANUTECH | | Manufacturing Technique | | (De Vore's Class) |
| | 1 | Drawn | 4 | Molded Wire-Would |
| | 2 | Wound | 5 | Blown |
| | 3 | Mold-Pressed | 6 | Hand Formed |
| STRUCTUR | | Structure | | (De Vore's Series) |
| | 1 | Simple | 3 | Complex (applique) |
| | 2 | Compound (layered) | 4 | Composite (compound + complex) |
| SHAPE | | Shape Class | | (De Vore's Type) |
| | 1 | Tubular | 6 | Spherical |
| | 2 | Hexagonal | 7 | Donut |
| | 3 | Hexagonal Faceted | 8 | Teardrop |
| | 4 | Oval | 9 | Conical |
| | 5 | Barrel | | |
| PRICOLOR | | Primary (outer) Color and Diaphaneity | | (De Vore's Variety) |
| Major Color Class and | | | | Diaphaneity separated by a Decimal |
| | 1 | White | . 1 | Opaque |
| | 2 | Gray | . 2 | Translucent |
| | 3 | Brown | . 3 | Transparent |
| | 4 | Black | | |
| | 5 | Yellow | | |
| | 6 | Red (including deep purple) | | |
| | 7 | Green | | |
| | 8 | Blue | | |
| SECCOLOR | | Secondary (inner) Color [Coded Same as Primary Color] | | |
| THRDCOLO | | Tertiary Color [Coded Same as Primary Color] | | |
| COLCOLOR | | Collapsed Primary Color | | |
| | 1 | White | 6 | Red (not deep purple) |
| | 4 | Deep Purple/Black | 7 | Green |
| | 5 | Yellow | 8 | Blue |
| COUNT | | Count of Specimens with Identical Codes | | |
| DE VORE | | De Vore Type | | |
| ROSS | | Ross Type/Variety | | |
| KIDD | | Kidd Type | | |

formed (CVI). For a definition and thorough discussion of the first five manufacturing techniques listed, see Kidd and Kidd (1970, 1983), De Vore (1992) or Ross (2000). The last class listed, hand-formed, was included (particularly in the Fort Clark analysis that uses the same system) to explore Native production of glass beads from crushed trade beads (Billeck 2000).

*Structural Complexity (De Vore's Series)*

Four possible categories were considered, although only the first two occur in the Scattered sample. Beads may be simple (De Vore's series A, or SA), compound (SB), complex

(SC), or composite (SD). In the present analysis, simple beads (SA) are defined as having been constructed of one color/layer of glass and show no evidence of layering or applique. Compound beads (SB) are layered, and complex beads (SC) contain applique or inset decoration. Composite beads (SD) are both layered and display applique or inset decoration.

*Shape (De Vore's Type)*

Shapes considered for the present study include: tubular or cylindrical (De Vore's type 1, or T1), hexagonal (T2), hexagonal faceted (T3), oval (T4), barrel (T5), spherical (T6), donut (T7), teardrop (T8), and conical (T9).

*Color and Diaphaneity (De Vore's Variety)*

A single variable in the data set is used to record color in combination with diaphaneity, in a decimalized format that allows easy sorting of the data. In the present study, this level of color classification was handled in a general fashion, rather than with the aid of Munsell charts. Drawing on Ahler and Drybred (1993), the color classes are: white (1), gray (2), brown (3), black (4), yellow (5), red/pink/purple (6), green (7), and blue (8). Diaphaneity, or the amount of light that passes through glass, was divided into three classes: opaque (1), translucent (2), and transparent (3).

When coding occurred for a given bead, the attributes of color and diaphaneity were combined into a single term, with color, a decimal, then the diaphaneity code. This is a departure from the coding system used in De Vore's Fort Union report (1992), where letters represent color, diaphaneity and other surface characteristics. In the present analysis, a blue opaque bead would receive the code 8.1 (blue, opaque), regardless of manufacturing technique, structure, or shape. Beads that are layered or decorated with multiple colors receive a series of color codes (primary, secondary, and tertiary; Table 15.1), ordered according to the prominence of the colors or layers present. For example, a bead with an exterior layer of translucent red glass and an interior layer of opaque white glass would receive a primary color of 6.2 and a secondary color of 1.1.

We also recorded a collapsed primary color code that provides a rapid grouping based on general color class and ready comparison with data presented by Ahler and Drybred (1993). This color code ignores diaphaneity and collapses black and deep purple beads into a single general color class. We discovered during the course of this study and that of Fort Clark beads that most of the beads that appear opaque and black at a distance are actually a very deep, translucent purple when viewed wet, magnified, and under very strong light. Because all of these beads appear to be black, and are comparable to beads recorded as black in the Ahler and Drybred study, we combined deep purple and black into a single class for purposes of data comparison.

## Full Bead Collection

The bead set studied for Chapter 5 originally contained perhaps 58 specimens, but during the sequence of examination by several parties, the target sample was narrowed a bit. One bead was found to occur in a mixed context in excavation squares at the east end of Block 6, and because it could not be assigned to a time period unit, it was excluded from the study (Cat No. 2459). This, unfortunately, was one of the rarer larger beads in the sample, being a medium sized, drawn, compound, oval-shaped, opaque white specimen. It remains a valid part of the overall site assemblage, but its inclusion gives some bias to density studies that are context- and period-specific.

Close examination by Badorek indicated that one item tabulated by Ahler as a glass bead was in fact a small spherical piece of fused, glass-like material resembling coal clinker that occurs at many places in the site. This specimen is thought to be historic debris, and it was omitted from final bead analysis.

Bill Billeck's examination of the collection proved very helpful. He clarified that two of the larger white beads were drawn, rather than wound, in manufacture (e-mail communication to S. Ahler, March 12, 2001), and he noted that a specimen we had classified as a glass bead was in fact a small stone bead, apparently made of turquoise (e-mail communication to S. Ahler, April 24, 2001). The latter information was not received in time for inclusion in the stone tool chapter. This stone bead is bluish green in color (Munsell 5BG 6/4), is very symmetrical with a flattened cylindrical form (3.4 mm diameter, 1.0 mm long) with a drilled hole ca. 1.0 mm in diameter. It was found in general level 1 in square 515NE439 in Block 6.

Upon close examination, one other bead was considered for exclusion from the analysis. This is a nearly spherical, medium sized specimen (5.1 mm diameter, 4.7 mm long) made of clear glass, found in level 2 in square 515NE439 in Block 6 (the same square that produced the turquoise bead in level 1). Manufacturing technique is difficult to determine for this specimen, because the glass is completely clear and contains no gas bubbles. Billeck was of the opinion that the bead was probably wound. Ahler noted that the bead is slightly biconical in form, suggesting that it may have been mold-pressed on a wire. One flattened area also occurs on the bead. The entire surface of the bead appears frosted, and under magnification this is seen to be pitting from abrasion with many microscopic cone fractures occurring on the surface. The bead has a highly battered appearance, as if it were extensively tumbled or shaken in a rattle in contact with items of similar or larger size. Yet, the surface of the glass is not patinated or chemically pitted, as is the case for nearly all other specimens in the collection. In addition, the hole in the bead is very small (ca. 0.7 mm), about half the diameter of holes of other beads of similar size made by the drawing technique. There is no question that this particular bead was derived from a manufacturing technology completely different from the other glass beads in the collection. The lack of patination and chemical weathering suggest that it is much more recent in age than the other beads. However, its context, near on the floor of the burned lodge in Block 6, suggests that it may be part of the village collection. Given the fact that this bead was found one level beneath a turquoise bead, of apparent southwestern origin, we cannot rule out the possibility that this clear bead may be a rare type of Spanish origin rather than Venetian manufacture. Neither author is familiar enough with Spanish trade artifact literature to evaluate this possibility. Under this circumstance, we have opted to include this bead in the data tabulations and analysis.

The final bead study sample consists of 55 specimens, and its size distribution is provided in Table 15.2. Chi-square analysis indicates no significant difference is class frequency by time period ($X^2$=4.55, df=3, p=.207). Ahler and Drybred present a method for computing a mean bead size for an assemblage by multiplying count of beads in a size class by the midpoint of the diameter range for that class, summing, and dividing by the total count of beads. They demonstrated significant change in mean bead size through time, with earliest assemblages having higher mean size, and with mean size decreasing rather steadily through time (Ahler and Drybred 1993:316,Figure 21.8).

Table 15.2. Glass bead size class distribution, mean bead size, and bead density by time period for the Scattered Village collection (32MO31), 1998 excavations.

| Size Class | | Time Period | | Total |
|---|---|---|---|---|
| | | TP1 | TP2 | |
| Large (6-10mm) | n | 3 | 2 | 5 |
| | % | *7.3* | *14.3* | *9.1* |
| Medium (4-6mm) | n | 1 | 1 | 2 |
| | % | *2.4* | *7.1* | *3.6* |
| Small (2-4mm) | n | 37 | 10 | 47 |
| | % | *90.2* | *71.4* | *85.5* |
| Very Small (<2mm) | n | 0 | 1 | 1 |
| | % | *0.0* | *7.1* | *1.8* |
| Total N | | 41 | 14 | 55 |
| *Percent* | | *74.5* | *25.5* | *100.0* |
| **Mean Bead Size** | | **3.41 mm** | **3.76 mm** | **3.50 mm** |
| Excav. Volume $m^3$* | | 9.961 | 19.236 | 29.197 |
| **Density, n/$m^3$** | | **4.12/ $m^3$** | **0.73/ $m^3$** | **1.88/ $m^3$** |

* Note: volumes are adjusted for added Priority 2 material from Feature 14 (TP1, 0.336 $m^3$) and Feature 178 (TP2, 0.406 $m^3$) that was sorted for selected artifacts, including trade items.

The mean bead size figures for Scattered Village – 3.76 mm for TP2, 3.41 mm for TP1, and 3.50 mm overall – are internally consistent (slight decrease later in time), and are highly compatible with figures obtained for Hidatsa sites. For a sample of only four beads from two Hidatsa sites dated in the period AD 1600-1650, the mean size is 3.50 mm; for a sample of 35 beads from the same two sites dated in the period AD 1650-1700, the mean size is 3.46 mm; and for a sample of 49 beads from the same two sites in the period AD 1700-1750 the mean size is 3.14 mm (Ahler and Drybred 1993:317). Thus, the Scattered Village data appear highly consistent with this time trend and also with our chronological placement of the TP1 and TP2 sample in the period AD 1600-1700.

Bead density values are also shown by time period in Table 15.2. The respective values for the earlier and later postcontact periods (TP2 and TP1) are 0.73 and 4.12 items per $m^3$, respectively. These values are quite compatible with density values for the same time blocks (AD 1600-1650, and AD 1650-1700) for Lower Hidatsa Village (0.8 and 1.6 items per $m^3$) and Big Hidatsa Village (1.2 and 7.7 items per $m^3$) (means for both sites combined are 1.0 and 4.3, respectively) (Ahler and Drybred 1993:Table 21.8). These data form some of the basis for assigning chronological age estimated to the TP units at Scattered Village.

The collection therefore consists of seven medium or large beads and 48 small or very small beads. It is reasonable to organize further analysis according these two basic size classes – those greater than and those less than 4.0 mm in diameter. This effectively separates larger, individual specimens that were often hand made and intended for individual stringing, etc., from smaller specimens that were mass-produced and intended for use as patterned arrangements sewn onto clothing. This same size separation was made by Ahler and Drybred (1993) in their study of beads from Knife River, and a similar approach is being followed in the analysis of beads from Fort Clark, in progress. Hereafter, discussion is organized according to these two basic size groups.

**Smaller Beads (Small and Very Small Size Classes)**

Forty-eight beads occur in this size group, and it is useful to summarize various attribute data for these beads according to time period, and thereby facilitate discussion of the attributes of these beads as a group and to also observe variation by time period, if there is any. Table 15.3 summarizes various attribute data for the smaller beads. A few comments can be provided concerning attribute details.

All 48 beads are of drawn manufacture, which is typical for smaller size beads. Four beads have a compound or layered structure, and all of these occur in the later time period (TP1). These four beads are all white (opaque white) in color, and consist of two very similar layers of glass. Blue and black/purple beads are not constructed with layered structure, which is typical of such beads in other collections, as well. The small beads have two shapes, with barrel shaped beads being significantly more common in the later time period. Barrel shape is highly correlated with color, as 22 of the 25 purple/black beads have this form. The blue beads and white beads are predominantly donut shaped (shorter in relation to diameter and more rounded). Both collapsed color and primary color differ significantly according to time period. The TP2 (earlier) sample is dominated by blue beads, and the purple/black beads occur nearly exclusively in the later TP1 sample. This may in part be a result of sampling. The black/purple beads are far from randomly distributed within the site deposits. All but one of the beads of this color occur in two pit features (F14 in Block 2 and F26 in Block 3), with counts about equally distributed in each pit. Thus, these two features appear to reflect specific bead loss episodes involving batches of beads of similar color, a color that is not widely occurring elsewhere in the site.

For this reason, it is not clear how much weight to give the presence of the black/purple color class regarding comparisons with color data for other sites. If we dropped all or most of the black/purple beads out of the collection it would be quite similar to that from the same time frame at the Knife River sites. In those collections, donut shaped (ring) beads dominate the samples, simple rather than layered beads are dominant, and blue is the dominant color. Interestingly, the only time unit at Knife River in which black beads have a noticeable presence is the very earliest unit, where two of three small beads are black.

In summary, the smaller bead sample from Scattered Village presents some new information regarding the unusually high frequency of black/purple beads. This may be due to sampling bias, however; otherwise, the sample from Scattered Village is similar in nearly all regards to the sample in the same time frame from Knife River. The 48 beads from Scattered more than double the previously known sample of 35 specimens for the seventeenth century from the Knife Region sites.

Table 15.3. Summary information for small and very small beads regarding pertinent variables according to time period, Scattered Village (32MO31, 1998 excavations). Cells with associated standardized residual values >+1.0 are shaded for emphasis.

| | | TP1 Later Postcontact | TP2 Early Postcontact | Total |
|---|---|---|---|---|
| Manufacturing Technique | Drawn | 37 | 11 | 48 |
| Structure | Simple | 33 | 11 | 44 |
| | | *89.2%* | *100.0%* | *91.7%* |
| $X^2$=1.29, df=1, p=.254 | Compound | 4 | 0 | 4 |
| | | *10.8%* | *.0%* | *8.3%* |
| | Total | 37 | 11 | 48 |
| Shape | Barrel | 23 | 0 | 23 |
| | | *62.2%* | *.0%* | *47.9%* |
| $X^2$=13.12, df=1, p=.0029 | Donut | 14 | 11 | 25 |
| | | *37.8%* | *100.0%* | *52.1%* |
| | Total | 37 | 11 | 48 |
| Collapsed Color | White | 4 | 1 | 5 |
| | | *10.8%* | *9.1%* | *10.4%* |
| $X^2$=12.56, df=3, p=.0057 | Purple/Black | 24 | 1 | 25 |
| | | *64.9%* | *9.1%* | *52.1%* |
| | Yellow | 1 | 1 | 2 |
| | | *2.7%* | *9.1%* | *4.2%* |
| | Blue | 8 | 8 | 16 |
| | | *21.6%* | *72.7%* | *33.3%* |
| | Total | 37 | 11 | 48 |
| Primary Color | Opaque White | 4 | 1 | 5 |
| | | *10.8%* | *9.1%* | *10.4%* |
| $X^2$=15.54, df=5, p=.0083 | Opaque Black | 10 | 0 | 10 |
| | | *27.0%* | *.0%* | *20.8%* |
| | Opaque Yellow | 1 | 0 | 1 |
| | | *2.7%* | *.0%* | *2.1%* |
| | Translucent Yell | 0 | 1 | 1 |
| | | *.0%* | *9.1%* | *2.1%* |
| | Tralct Red (Pur) | 14 | 1 | 15 |
| | | *37.8%* | *9.1%* | *31.3%* |
| | Translucent Blue | 8 | 8 | 16 |
| | | *21.6%* | *72.7%* | *33.3%* |
| | Total | 37 | 11 | 48 |
| | *%* | *77.1%* | *22.9%* | *100.0%* |

**Larger Beads (Medium and Large Size Classes)**

Seven larger beads occur in the site sample. It is easier to describe these than to provide information in tabular form. Two of these are medium in size and five are large in size, and they are about equally distributed between the two temporal units (TP1 produced 4 and TP2 produced 3) (Table 15.2). One bead is classified as mold-pressed in manufacture – the clear glass specimen from TP2 already described in detail – and it need not be discussed again in detail. All six of the remaining beads are drawn. Two of the remaining beads are compound or layered in structure, and these are made of opaque white on opaque white glass. The layering in these is subtle but can be seen with magnification. The single white bead from a mixed context in Block 6 is also layered and white on white. All of the white beads are oval shaped or teardrop shaped (decidedly elongated). Of the four remaining non-white beads, all are simple in structure, three are blue (one translucent and 2 transparent), one is deep purple. Of the non-white beads, two have a barrel shape and two have a donut shape (the distinction is subtle). All of these beads (except the clear one) have large numbers of gas bubbles and heavily eroded surfaces.

One blue bead and the deep purple bead are split, and on the split face one can observe that while the beads are drawn and the bubbles align in stringers paralleling the axis of the hole, these stringers are also curved and pinch together near the opening of the hole at either end of the bead. Thus, it appears that manufacture did not involve simply snapping a tube and rounding it by abrasion. Rather, the ends of the beads are pinched together and perhaps drawn slightly outward, *after the bead was segmented from the tube*. Whether this involves simply tumbling in a semi-molten state is not clear, but seems unlikely given the nature of the gas bubble structures within the beads. This may reflect a specific technique for manipulating each large bead individually, which may have chronological significance if recorded in a systematic fashion.

In sum, in addition to the single peculiar clear glass bead of uncertain association, there are two basic kinds and three color variants within the sample of larger beads. There are elongated, oval shaped layered white beads that vary somewhat in individual size, and there are simple barrel/donut-shaped beads that occur in blue (n=3) and deep purple (n=1) colors.

A final summation of the glass bead collection can be given in the form of a hierarchical classification of the full collection based on all of the attributes recorded as well as cross correlations with Ross (2000) and De Vore (1992) bead types/varieties. Such a classification is provided in Table 15.4, which list each unique combination of attributes that define the 18 "types" that occur in the Scattered sample. One may use this listing to relate all of the beads found in the present sample to the typologies used by other analysts.

## Trade Metal Artifacts

A substantial amount of recent metal occurs in some excavated parts of the site, and our guidelines for distinguishing recent metal from trade metal are discussed in detail in Chapter 5. Also in that chapter, we present counts of trade metal artifacts by excavated context and discuss the use of such data for assignment of contexts to analytic units based on apparent relative chronology. In this section, we present more refined data on trade metal artifacts, including information on metal artifact size, type, densities, and functional classification.

Table 15.4. Hierarchical typology of all glass beads in the study sample, Scattered Village (32MO31), 1998 excavations.

| Type | Size Class | Manu Technique | Structure | Shape Class | Primary (outer) Color | Secondary (inner) | Devore Code | Ross Code | N |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 Large (6-10mm) | 1 Drawn | 1 Simple | 5 Barrel | 6.2 Tralct Red (Purple) | . | | 86/305 | 1 |
| 2 | 2 Large (6-10mm) | 1 Drawn | 1 Simple | 7 Donut | 8.2 Translucent Blue | . | CISAT1Vb | 3 | 1 |
| 3 | 2 Large (6-10mm) | 1 Drawn | 1 Simple | 7 Donut | 8.3 Transparent Blue | . | CISAT1Vs | 10 | 1 |
| 4 | 2 Large (6-10mm) | 1 Drawn | 2 Compound | 4 Oval | 1.1 Opaque White | 1.1 Opaque White | CIISBT6V | 249 | 1 |
| 5 | 2 Large (6-10mm) | 1 Drawn | 2 Compound | 8 Teardrop | 1.1 Opaque White | 1.1 Opaque White | | | 1 |
| 6 | 3 Medium (4-6mm) | 1 Drawn | 1 Simple | 5 Barrel | 8.2 Translucent Blue | . | CISAT3Vb | | 1 |
| 7 | 3 Medium (4-6mm) | 1 Drawn | 2 Compound | 4 Oval | 1.1 Opaque White | 1.1 Opaque White | CIISBT6V | | 1 |
| 8 | 3 Medium (4-6mm) | 3 Mold-Pressed | 1 Simple | 6 Spherical | 1.3 Trnspt White (Clear) | . | | | 1 |
| 9 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 5 Barrel | 4.1 Opaque Black | . | CISAT1Vf | 19 | 10 |
| 10 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 5 Barrel | 5.1 Opaque Yellow | . | CISAT1Vk | 69 | 1 |
| 11 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 5 Barrel | 6.2 Tralct Red (Purple) | . | | 86/305 | 12 |
| 12 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 7 Donut | 1.1 Opaque White | . | CISAT1Va | 6 | 1 |
| 13 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 7 Donut | 6.2 Tralct Red (Purple) | . | | 30 | 1 |
| 14 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 7 Donut | 6.2 Tralct Red (Purple) | . | | 86/305 | 2 |
| 15 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 7 Donut | 8.2 Translucent Blue | . | CISAT1Vb | 3 | 6 |
| 16 | 4 Small (2-4mm) | 1 Drawn | 1 Simple | 7 Donut | 8.2 Translucent Blue | . | CISAT1Vn | 10 | 10 |
| 17 | 4 Small (2-4mm) | 1 Drawn | 2 Compound | 7 Donut | 1.1 Opaque White | 1.1 Opaque White | | 8 | 4 |
| 18 | 5 Very Small (<2mm) | 1 Drawn | 1 Simple | 7 Donut | 5.2 Translucent Yellow | . | CISAT1Vy | 69 | 1 |
| | Total | | | | | | | | 56 |

## Methods

All certain and probable trade metal artifacts were quantified, analyzed, and coded in some detail. Table 15.5 lists the variables observed and recorded during this analysis. Additional details can be provided regarding certain variables. All metal pieces were examined and classified as ***patterned or unpatterned***. Unpatterned items included irregularly shaped pieces of cut scrap in the instance of copper, or amorphous chunks or bits with no form whatsoever in the case of iron. Patterned items generally had a regular form and, in most cases, could be assigned a possible functional classification. Unique ***specimen numbers*** were assigned to individual patterned metal artifacts, primarily for purposes of labeling and tracking for illustration. A very small number of unpatterned items remained ***uncertain*** regarding their age and origin (recent or trade?). These were coded as probable trade items, and were included in the data summaries. Each artifact was placed in a ***general type*** group that documented both its raw material (iron versus copper/brass) as well as presence or absence of patterning. Each patterned object was assigned to a ***specific and a more general functional group or class***. The recognized specific classes were numbered as they were encountered during the course of analysis, but the classification used here generally conforms to that used in the study of trade metal from Knife River Village sites (Ahler and Drybred 1993:293-295). The content and distribution of the general and specific functional classes will be discussed in subsections that follow. The count and weight were recorded for single and grouped items documented under a single database record. Length, width, and thickness were recorded for individual patterned objects only.

Table 15.5. Variables recorded in analysis of trade metal artifacts, Scattered Village (32MO31), 1998 excavations.

| | | | | |
|---|---|---|---|---|
| CATNO | | Catalog Number | | |
| UNPAT | | Patterned or Unpatterned | | 1=unpatterned; 2=patterned |
| SPECNO | | Specimen Number | | assigned uniquely to patterned only |
| CERT | | Certainty that Artifact is Trade | | 1=certain; 2=probable |
| SIZE | | Size Grade | | G1 – G4 |
| GENTYPE | | Material and Patternedness | | |
| | 1 | unpatterned copper/brass | 3 | unpatterned iron |
| | 2 | patterned copper/brass | 4 | patterned iron |
| FUNC | | Specific Functional Class | | |
| | 1 | rolled tube | 7 | arrowpoint |
| | 2 | probable awl | 8 | rolled hook |
| | 3 | knife blade | 9 | pin or shaft with head |
| | 4 | rolled cone | 10 | coil spring |
| | 5 | rolled bead | 11 | - |
| | 6 | rolled ring | 13 | shaped, unknown function |
| GENFUNC | | General Functional Group | | |
| | 1 | weapons/hunting gear | 3 | Native-made ornaments |
| | 2 | domestic items | 4 | miscellaneous |
| COUNT | | | | |
| WEIGHT | | to 0.1 gram | | |
| LENGTH | | to 0.1 mm for patterned artifacts only | | |
| WIDTH | | to 0.1 mm for patterned artifacts only | | |
| THICKNESS | | to 0.1 mm for patterned artifacts only | | |

**Trade Metal Composition and Variation**

Size and metal type for the trade metal sample for the site as a whole are summarized in Table 15.6. These data indicate that the sample consists of 233 individual pieces, that a little more than one-third of this is copper/brass and the remainder iron, and that the sample is composed mostly of highly divided pieces – only 25% is size grade G3 or large in dimension. The majority of the copper/braces specimens are classified as patterned items, while only about one in six iron specimens arise classified as pattered. These features are typical for trade metal recovered with fine-screen methodology. Iron pieces are typically friable, and some iron artifacts probably rusted apart into multiple specimens while the site was being occupied. Through time, the iron specimens tend to multiply in number through the continuing process of decomposition, while copper and brass specimens are far more stable.

Table 15.6. Summary of count (top) and weight (bottom, grams) data by size grade and general artifact type for trade metal artifacts at Scattered Village (32MO31), 1998 excavations.

| ***Count Data*** | | Size Grade | | | | |
|---|---|---|---|---|---|---|
| General Type | | G2 | G3 | G4 | G5 | Total |
| unpatterned cupric | n | | 5 | 15 | 7 | 27 |
| | % | | *18.5%* | *55.6%* | *25.9%* | *100.0%* |
| patterned cupric | n | | 13 | 25 | 16 | 54 |
| | % | | *24.1%* | *46.3%* | *29.6%* | *100.0%* |
| unpatterned iron | n | 1 | 18 | 81 | 28 | 128 |
| | % | *.8%* | *14.1%* | *63.3%* | *21.9%* | *100.0%* |
| patterned iron | n | 3 | 19 | 2 | | 24 |
| | % | *12.5%* | *79.2%* | *8.3%* | | *100.0%* |
| Total | n | 4 | 55 | 123 | 51 | 233 |
| | % | *1.7%* | *23.6%* | *52.8%* | *21.9%* | *100.0%* |
| ***Weight Data*** | | | | | | |
| General Type | | | | | | |
| unpatterned cupric | n | | 1.30 | .98 | .18 | 2.46 |
| | % | | *52.8%* | *39.8%* | *7.3%* | *100.0%* |
| patterned cupric | n | | 8.30 | 3.36 | .48 | 12.14 |
| | % | | *68.4%* | *27.7%* | *4.0%* | *100.0%* |
| unpatterned iron | n | 5.60 | 8.90 | 8.35 | .45 | 23.30 |
| | % | *24.0%* | *38.2%* | *35.8%* | *1.9%* | *100.0%* |
| patterned iron | n | 19.90 | 18.80 | 1.40 | | 40.10 |
| | % | *49.6%* | *46.9%* | *3.5%* | | *100.0%* |
| Total | n | 25.50 | 37.30 | 14.09 | 1.11 | 78.00 |
| | % | *32.7%* | *47.8%* | *18.1%* | *1.4%* | *100.0%* |

Weight data are also provided for the site sample in Table 15.6. The total sample weighs only 78 grams. Copper/brass constitutes less than 15 grams of this total. Overall, the sample is remarkably small (as can be seen in illustrations of patterned objects); the majority of patterned copper/brass specimens would not have been found without fine-screen recovery.

Table 15.7 summarizes count and weight data for trade metal (metal types combined) by size grade and according to time periods (TP1 and TP2). This table also provides data for excavated volume and density values by count for size G1-G5 and G1-G3 artifacts and by weight for G1-G5 artifacts. Both count and weight density values exhibit a four- to six-fold difference for TP1 versus the early TP2 contexts. This is expected because trade artifact densities were used to make the analytic unit distinctions. The density figures in Table 15.5 are somewhat greater than the count and weight figures for G1-G5 items recorded for combined data from two Hidatsa sites at Knife River for what are thought to be comparable time units: n/m$^3$ values of 0.7 and 5.2 items/m$^3$ and g/m$^3$ values of 0.4 and 5.8 g/m$^3$ for the periods AD 1600-1650 and AD 1650-1700, respectively (Ahler and Drybred 1993:Table 21.2). The Scattered Village density by count values show the greatest deviation from the Hidatsa site the values.

Table 15.7. Count and weight distribution of trade metal artifacts by count and by weight according to time period, with data on metal density by count and by weight according to time period for Scattered Village, (32MO31), 1998 excavations.

| | | *Count Data* | | | | *Weight Data* | | |
|---|---|---|---|---|---|---|---|---|
| | | Time Period | | | | Time Period | | |
| Size Grade | | 1 later postcontact | 2 early postcontact | Total | | 1 later postcontact | 2 early postcontact | Total |
| G2 | n | 2 | 2 | 4 | wt | 18.80 | 6.70 | 25.50 |
| | % | *1.1%* | *3.5%* | *1.7%* | % | *35.0%* | *27.6%* | *32.7%* |
| G3 | n | 38 | 17 | 55 | wt | 23.30 | 14.00 | 37.30 |
| | % | *21.6%* | *29.8%* | *23.6%* | % | *43.4%* | *57.6%* | *47.8%* |
| G4 | n | 92 | 31 | 123 | wt | 10.66 | 3.43 | 14.09 |
| | % | *52.3%* | *54.4%* | *52.8%* | % | *19.9%* | *14.1%* | *18.1%* |
| G5 | n | 44 | 7 | 51 | wt | .93 | .18 | 111 |
| | % | *25.0%* | *12.3%* | *21.9%* | % | *1.7%* | *.7%* | *1.4%* |
| Total | n | 176 | 57 | 233 | wt | 53.69 | 24.31 | 78.00 |
| | % | *100.0%* | *100.0%* | *100.0%* | % | *100.0%* | *100.0%* | *100.0%* |
| Excavated Volume m$^3$* | | 9.961 | 19.236 | 29.197 | | 9.961 | 19.236 | 29.197 |
| Density, n or g/m$^3$ | | 17.66 | 2.96 | 7.98 | | 5.39 | 1.26 | 2.67 |
| Density Size G3 n/m$^3$ | | 4.02 | 0.99 | 2.02 | | | | |

* Note: volumes are adjusted for added Priority 2 material from Feature 14 (TP1, 0.336 m$^3$) and Feature 178 (TP2, 0.406 m$^3$) that was sorted for selected artifacts, including trade items.

Ahler and Drybred also computed count density by number of items of size G3 and larger in order to work around sampling variation that may derive from differential fragmentation of iron into very small pieces, and possible variation in sorting methodology from project to project that may also affect counts of extremely small iron specimens. For Scattered Village, the G1-G3 count density values are 0.99 and 4.02 for the early and late periods, respectively, and for the combined Hidatsa site data the values are 0.5 and 1.9 items/m$^3$. For the Hidatsa sites, this measure increases to a value somewhere between 4.9 and 11.9 items/m$^3$ for the period AD 1700-1750, meaning that the density measures computed for Scattered Village are in general alignment with the Hidatsa site data.

One difference between the site assemblages that does affect density data is the relatively high number of very small rolled copper beads in the Scattered Village sample, an artifact type that is not particularly in evidence at the Hidatsa Villages. Furthermore, such artifacts occur in distinct clusters within Scattered Village, appearing to have been deposited as part of a single piece of decorated clothing (see following discussion). This means that overall density values for Scattered Village could be somewhat inflated due to the vagaries of sampling. This same problem was noted by Ahler and Drybred (1993:297) regarding data from a single excavated context at Big Hidatsa Village.

The functional composition of patterned trade metal items is summarized by time period as well as specific and grouped functional classes in Table 15.8. The functional makeup of the sample is fairly simple, with a modest number of classes represented. Chi-square analysis indicates no significant difference in functional makeup between the two temporal units. Examples of most of the artifact categories are illustrated in Figure 15.1.

*Weapons/Hunting Gear*

One item occurs within the general class of weapons, this being what is interpreted as a possible arrowpoint (Figure 15.1o). This is a small isosceles triangle of copper that is heavily bent; the apex of the triangle or potential tip of the point is curled back on itself, as one might expect from impact against a hard object. No iron arrowpoints, gun parts, or gunflints occur in the sample.

A second item in this general group associated with possible food procurement is a thin rolled copper piece subsequently shaped into a hook (Figure 15.1q). This could be a fishhook, and is therefore included in the general functional group.

*Domestic Items*

This functional group is intended to include every day, utilitarian tools likely to have been used in domestic and maintenance activities. A dozen specimens interpreted to be ***metal knife blades*** occur in this group (Figure 15.1a-h). Four copper/brass specimens are more confidently classified as knife blades because they still exhibit a sharpened beveled cutting edge along one of the longer margins. The iron specimens (Figure 15.1a-e) are less confidently classified as knives, but generally are thin and have at least one evenly convex longer edge. All of these artifacts presumably were fitted into slotted wood or bone handles (see Chapter 13). Eight specimens are classified as probable ***awl tips***. All are iron, and each specimen is a short, rod-like piece with a vague indication of a taper and point at one end (Figure 15.1i-m).

*Native-Made Ornaments*

This general functional group includes ornamental pieces that appear to have been fabricated by hand from pieces of metal cut from or reworked from larger items that may have originally had a different function. For example, some of these artifacts could have been made

Table 15.8. Functional classification of patterned or shaped trade metal artifacts according to time period for Scattered Village (32MO31), 1998 excavations. Distribution of functional classes by time period is not significant ($X^2$-13.00, df=10, p=.224).

| General Function | Function | | Time Period 1 later postcontact | 2 early postcontact | Total |
|---|---|---|---|---|---|
| ***Weapons*** | arrowpoint? | n | 1 | | 1 |
| | | % | *50.0%* | | *50.0%* |
| | rolled hook | n | 1 | | 1 |
| | | % | *50.0%* | | *50.0%* |
| Total | | n | 2 | | 2 |
| | | % | *100.0%* | | *100.0%* |
| ***Domestic*** | probable awl | n | 6 | 2 | 8 |
| | | % | *54.5%* | *22.2%* | *40.0%* |
| | knife blade | n | 5 | 7 | 12 |
| | | % | *45.5%* | *77.8%* | *60.0%* |
| Total | | n | 11 | 9 | 20 |
| | | % | *100.0%* | *100.0%* | *100.0%* |
| ***Native Ornaments*** | rolled tube | n | 4 | 3 | 7 |
| | | % | *11.1%* | *21.4%* | *14.0%* |
| | rolled cone | n | | 1 | 1 |
| | | % | | *7.1%* | *2.0%* |
| | rolled bead | n | 32 | 9 | 41 |
| | | % | *88.9%* | *64.3%* | *82.0%* |
| | rolled ring | n | | 1 | 1 |
| | | % | | *7.1%* | *2.0%* |
| Total | | n | 36 | 14 | 50 |
| | | % | *100.0%* | *100.0%* | *100.0%* |
| ***Miscellaneous*** | pin or shaft | n | 1 | | 1 |
| | | % | *25.0%* | | *16.7%* |
| | coil spring | n | 1 | | 1 |
| | | % | *25.0%* | | *16.7%* |
| | shaped, unknown | n | 2 | 2 | 4 |
| | | % | *50.0%* | *100.0%* | *66.7%* |
| Total | | n | 4 | 2 | 6 |
| | | % | *100.0%* | *100.0%* | *100.0%* |

from sections cut from a thin-walled copper pot or kettle. These artifacts are placed in four specific classes, based largely on shape.

***Rolled metal beads*** are the most common item in this group. Three of the 41 specimens in this class are made of iron or steel (Figure 15.1dd-ff), and the remaining 38 are made of copper (Figure 15.1w-bb). Many of the copper specimens are extremely small, recovered mostly in size G4 and G5 residues, frequently measuring about 4 mm in diameter and less than 3 mm long, and made of copper far less than 1 mm in thickness. Many of these specimens were recovered in clusters, with several specimens occurring in single catalog numbers (e.g., Figure 15.1aa,bb). Twenty-three of the small beads, more than half of the total, occur in pit Feature 127 in Block 8; other concentrations of five and six specimens occur in pit Feature 132 (Block 9) and F178 (Block 2). The clusters of specimens in F127 and F178 suggest that they were deposited as

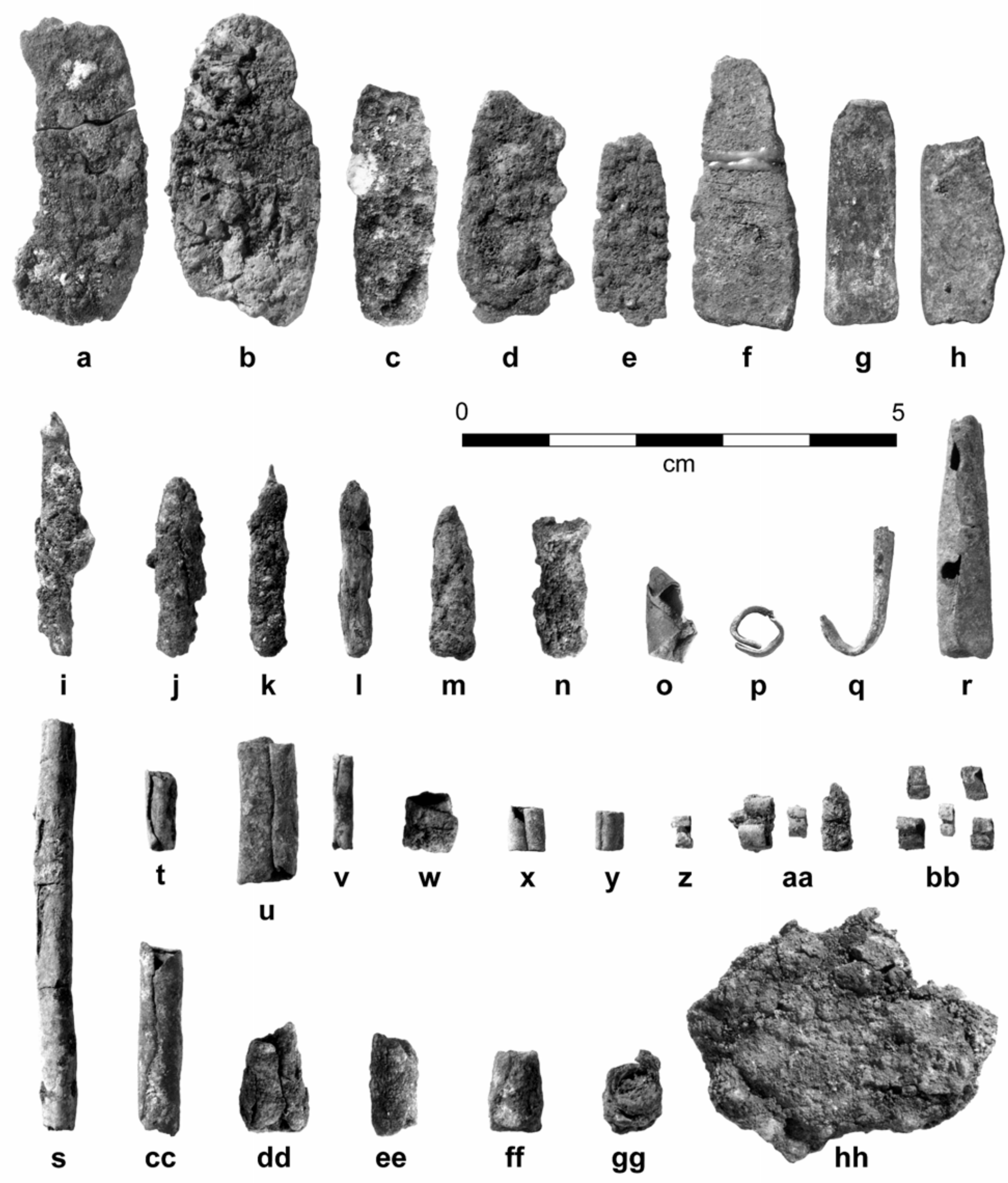


Figure 15.1. Photographs of trade metal artifacts, Scattered Village (32MO31), 1998 excavations. A-e: iron knife blades; f-h: copper knife blades; I-m: iron awl tips; n: iron pin; o: copper arrowpoint; p: copper wire; q: copper fishhook; r: copper cone/tinkler; s-cc: copper tubes and beads; dd-ff: iron tubes or beads; gg: iron spring; hh: shaped iron piece, unknown function. Note that artifacts are larger than actual size.

part of a string of beads or perhaps specimens sewn into a decorative pattern on an item of clothing.

***Rolled metal tubes*** are less common than beads, and are distinguished from beads by a length at least three times the diameter (Figure 15.1s-v,cc). All are made of copper. One especially long tube was found in F127 (Block 8) where a concentration of very small beads was also found. A single ***rolled cone*** occurs in the collection, this being larger than most of the tubes and all of the beads (Figure 15.1r). One small ***rolled metal ring*** also occurs, this having been made of a tightly rolled piece of very thin copper that was subsequently formed into a small ring about 5 mm across (Figure 15.1p).

*Miscellaneous*

A few miscellaneous items of uncertain function also occur. One is an iron or steel ***cylindrical shaft or pin*** with an expanded and flattened head on one end (Figure 15.1n). This could be a manufactured item of some kind, and could have been a part in a firearm. It cannot be determined if it was treaded. One small piece of coiled iron wire occurs in the sample (Figure 151.g). We have classified this as a ***coil spring***, which it resembles, although it could as easily have been a decorative item in the context of its use. Finally, four pieces of iron classified as ***shaped pieces of uncertain function*** occur in the collection. The largest of these is illustrated in Figure 15.1hh, and this is the largest single piece of iron in the entire site collection. All items in this class appear to be parts of once-larger iron objects that had a regular form, but which are now indeterminate as to function.

*Comparisons*

Ahler and Drybred (1993) studied changes in the makeup and frequencies of patterned metal items in the assemblages from Knife River Hidatsa sites, and their data sets and study offer basis for comparison. They recorded only six patterned metal items from deposits in a comparable time frame at Knife River, these being one awl, one knife blade, one rolled cone, one rolled bead/tube, one piece of shaped iron, and one piece of iron wire (Ahler and Drybred 1993:Table 21.3). Overall, this small sample is nearly identical regarding the types that occur in Scattered Village and the relative simplicity of both collections. Ahler and Drybred (1993:299-300) note that native-made ornaments dominate the metal artifact assemblages through the AD 1600s and 1700s, and such is the case at Scattered. They also note that among the native-made decorative items, tubes and beads occur early in the sequence and eventually were supplanted in popularity by conical specimens. This pattern pertains at Scattered, where 48 rolled tube/beads and a single rolled cone occur. Finally, Ahler and Drybred note that recognizable manufactured artifacts do not occur in the Hidatsa sites until the last half of the AD 1700s. The iron pin or shaft at Scattered Village may provide an exception to this generalization, but this artifact could also be a simple iron rod reworked by natives (flattened on the end by hammering), just as are all of the ornamental pieces.

## Summary

Trade artifacts in the form of glass beads and metal items occur in low frequencies in some of the excavated Scattered Village deposits. Based on the very low densities of these artifacts, the contexts where they were found have been given chronological assignments in the period AD 1600-1700. The bead and metal artifact collections are generally very similar in composition to trade artifact collections assigned to the same period from Hidatsa Village sites at Knife River.

The bead sample has a very large overall mean size (the largest recorded for any single collection studied to date), and this is consistent with its chronological placement. The glass bead collection is relatively simple in composition, consisting mostly of small blue, black/purple, and white beads, as well as two forms of larger beads (oval white and equidimensional blue and purple). One odd clear glass bead included in the sample stands apart from all the others; it is certainly of non-Venetian manufacture and may be recent in origin. Except for the clear specimen, all of the beads are drawn, all the white beads are layered in structure, and all of the non-white beads are simple in structure. These may be diagnostic features for the very earliest bead collections found over a much larger area.

The metal artifact sample consists predominantly of three kinds of specimens, rolled beads/tubes (decorative), knife blades, and awl tips. The bead/tube forms mimic very closely the shape of beads made from bone in the site collection. The relatively large number of knife blades is consistent with several bone knife handles fitted for metal blades found in the site. The presence of several awl tips in postcontact age contexts is consistent with the strongly diminishing occurrence of bone awls through the period of site occupation (Chapter 13).

Among both the bead samples and the metal artifact samples, sampling bias and the vagaries of depositional processes affect both the make-up and computed densities of trade artifact assemblages. This complication is to be expected when dealing with any relatively rare artifact class, and it is compounded by the fact that some of the smallest specimens (glass and copper beads) were probably used, not individually, but in clusters or batches (strings of beads or in decorative patterns on clothing). Purple/black beads may be statistically over-represented in the collection, having been found mostly in two clusters in two pit features. Similarly, small rolled copper beads were also found in clusters in two features. All of these contexts where clusters occur have fairly large excavated volumes, and trade artifact densities for any given feature are far higher than the density values computed for several contexts combined across the site. That is, had we by chance excavated only one or two of these "hot" pit features, we would have a very misleading idea of the temporal placement of that pit based on trade artifact density data alone. Thus, one must rely more heavily, where samples are large enough, on the composition of the sample for making a chronological assessment based on trade artifacts.