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WINNEBAGO INDIANS, 1634 - 1829:

AN ARCHEOLOGICAL AND ETHNOHISTORIC INVESTIGATION

by

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ABSTRACT

WINNEBAGO INDIANS, 1634 - 1829: AN ARCHEOLOGICAL AND ETHNOHISTORIC INVESTIGATION

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This report is an archeological and ethnohistoric investigation of the Winnebago Indians during the historic period. In implementing this multifaceted approach, three general problem areas have been explored: (1) questions concerning the immediate ancestry of the historically known Winnebagos; (2) patterns of change and stability during the historic period characterizing the Winnebago adaptation to conditions associated with European and later, American contact situations; (3) Winnebago culture as it existed during the late 18th to early 19th centuries, represented archeologically at a site located near Lake Koshkonong in Jefferson County, Wisconsin, excavated and analyzed as a part of this research project.

The study is fundamentally an examination of the potentials and limitations of the multifaceted approach with respect to the Winnebago tribe. Since such an approach had not previously been undertaken, a major research objective became the determination of the nature and the extent of archeological and historic resources available. Interpretations given are only tentative, contingent upon more intensive and extensive archeological and ethnohistoric research.

The investigation has demonstrated the potentials of a combined archeological/ethnohistoric approach, particularly as a

means of comprehensively interpreting the archeological site examined, in its historical and cultural context. It has also been shown that solution of problems concerning the immediate ancestry of the Winnebago tribe can only be provided by means of this approach. Finally, the study indicates the very real necessity for continued research of this type so that the complex patterns of change and stability in Winnebago culture during the historic period can be more fully understood and the cultural processes involved, illuminated.

The results of this analysis are interesting in light of the usual interpretation of a Late Historic Period occupation at Carcajou. Of the 25 identifiable flints in the collections 20 were of the Dutch spall type; 3 of the French type and 2 of the British type. This may suggest multiple occupations during the historic period at Carcajou and certainly indicates the presence of people at the site during the Middle Historic Period, or at least prior to 1770, perhaps in the early decades of the Late Historic Period. This information might imply either contemporaniety with the people living at Crabapple Point, or even occupancy of both sites by the same group of Indians.

TRADE BEADS

> The common denominator of the trade beginning in the 16th century was the lowly glass bead.
>
> --Arthur Woodward

Methods of Recovery

One of the most common classes of artifacts found at historic Indian sites are glass trade beads (see Plate 5). At Crabapple Point a total of 391 glass, 1 brass and 2 shell beads were recovered. The beads were collected in the field by excavating all squares entirely by trowel from a depth of 0.2' - 1.5', recording vertical and horizontal provenience for each specimen. In the laboratory, the sample size was increased when many beads were discovered in the processing of soil samples. Unfortunately, the combined problems of soil texture and moistness, almost continuous rainy weather and the lack of a readily accessible water

supply prevented the use of either wet or dry screening in the field, techniques which would have made excavation more efficient and would have substantially increased the bead sample size. The soil from the site was very moist and sticky so that even in the laboratory it was necessary to thoroughly dry all soil samples prior to screening. Given the results of bead recovery in the lab while processing soil samples, the field problems were unfortunate. In feature 10, for example, no dark colored beads (dark red and blue) were found during excavation. 41 were discovered while water screening soil samples from the feature. This unexpected finding, that dark colored beads were not being recovered in representative frequencies during excavation of the site, biases the provenience data presented below since soil samples were taken only from features and post holes and not from other areas of the site. The relative frequency of white and bright colored beads to darker specimens is also skewed. In feature 10 the ratio of light to dark colored beads is 2:1. This ratio would probably approximate that for the site as a whole if all areas had been screened. In general, it is felt that the bead sample is representative of the range of types which actually occurred at the site.

The Interpretive Potential of Trade Beads in Historic Archeology

Arthur Woodward in his discussion of trade beads makes several points which indicate both the potentials and the complexities of using trade beads for interpretive purposes at historic sites

(Woodward, 1965: 17-18). First of all, Woodward notes that preferences for particular bead types by different tribal groups were "based upon some fundamental beliefs of the people themselves" (Ibid.: 18). He suggests, for example, that "the colors and sizes of beads were usually dictated by the aboriginal color schemes prevalent in these regions as well as the modes of decorating either the person or garments in aboriginal times" (Ibid.: 17). Secondly, based on reports of traders and explorers, Woodward indicates that an item in demand one year might be rejected by the same group the next year. In other words, style preferences changed rather quickly through time. Therefore, we could expect that the bead inventories at different sites within a restricted geographical region might differ either because of temporal factors or because of the cultural affiliation of the groups occupying the sites. With proper documentary and archeological research, the problem of distinguishing the differences between sites in terms of cultural or temporal factors should be possible. Unfortunately, at this point in time, we are not able to unravel the complexities of trade bead significance either in terms of time or culture.

In an attempt to investigate the potential of ethnohistorical research with reference to trade beads, a brief survey of the American Fur Company papers available on microfilm at the State Historical Society was undertaken (see Table 3). The results of this superficial study indicate that a great deal of information with respect to bead nomenclature and classification, as well as

TABLE 3

TRADE BEADS LISTED IN AMERICAN FUR COMPANY INVENTORIES 1834-1840

Bead Types	MACKINAC OUTFIT 1834	FURNISHED SIOUX OUTFIT 1836	remaining at SIOUX OUTFIT 1837	WESTERN OUTFIT 1835 (Prairie du Chien)	WESTERN OUTFIT 1840 (Prairie du Chien)
Wampum					
Moons	3 sets				
Hair Pipes			313 (3 1/2)		
Black	40,050	81,750 black	18 lbs.	66,500 (2.8 1/4)	16,000 (3)
White	30,000	and white (2.8 1/4)	23 1/2 lbs.	63,259 (2.25)	12,450 (2.3)
Blue Beads					2 lbs. (25)
Sky bl.	130 lbs.				
Large Bl.					5 masses (25)
Fancy Beads	149 doz.			150 (10)	
Garnets			18 masses		
Mock	70 bunches	52 bunches			
Ruby				(60) 6 bunches	
Br ?				(50) 10 bunches	
Uncut					10 strings (1 1/2)
Agates					
Blue	22 bunches				
White	35 bunches	84 masses (25)	13 masses (25)		
Oval/wh.		17 masses (23)	2 masses (23)		
Cornaline		4 bunches			

TABLE 3 (continued)

Bead Types	MACKINAC OUTFIT 1834	FURNISHED SIOUX OUTFIT 1836	remaining at SIOUX OUTFIT 1837	WESTERN OUTFIT 1835 (Prairie du Chien)	WESTERN OUTFIT 1840 (Prairie du Chien)
Barley Corns White	12 bunches; 330 masses	400 masses (10)			
Colored		50 masses (13 1/2)			
Seed Beads	11 bunches	10 masses (13)	7 masses		14 masses(18 3/4) assorted
Black Beads	10 1/2 lbs.			30 lbs. (25)	20 lbs. (20)
White Beads Coarse				25 lbs. (20)	20 lbs.(12 1/2)
Chalk		49 lbs.(37 1/2)	8 1/2 masses	29 lbs.(37 1/2)	40 lbs. (33); 4 lbs. (35)
Large Glass		79 1/2 doz. (75)			
Cut Glass			11 1/2 doz.(75)	5 doz. (20)	150 masses (6 1/4)
Gold Beads					6 masses (25)
Blue & White			9 lbs.		
Spotted Sea Shell Beads	32				

NOTE: Figures in parentheses indicate cost per unit.

temporal and cultural dynamics is contained in this one major documentary resource. The records presented below cover the years 1834-1840. It will be noted that in these papers, information is presented pertaining to the inventories remaining on hand or furnished to individual trading outfits of the American Fur Company. Since the outfits usually traded with specific tribal groups residing in a particular locale, the differences in bead inventories should have cultural significance when the time factor is held constant. Conversely, if one investigates the yearly records of an individual outfit, changes in the inventories should be reflecting temporal shifts with respect to bead style preferences. The information presented here is meant only to indicate the kind of data available in the records. Much more intensive study would be necessary to critically evaluate the potentials and the weaknesses of this kind of resource.

The fur company inventories presented offer several interesting areas for further study, at least for the later years of the historic period (post 1800). First, it is possible from the records to establish the criteria upon which the traders differentiated between various bead types. These distinctions presumably had meaning for their Indian constituents since traders would have been ordering those types preferred by the Indians. This kind of information could be used very effectively when working with an archeological collection.

In the records covering a rather limited time period of six years, there was considerable consistency with regard to bead

nomenclature from year to year and from one outfit to the next. This is to be expected in the American Fur Company or any of the other larger trading companies and may not be the case in records kept by individual, independent traders who may have each had their own, idiosyncratic system of categorizing beads. Nonetheless, in these records, bead types were identified in part according to physical properties such as size, color and form, the same criteria used by historic archeologists in classifying beads from archeological sites. Broader categories such as wampum, fancy beads, garnets, agates, barley corns, etc. referred to a combination of physical properties, particularly shape. Many of these terms continue to be used at the present time. In spite of the fact that the terms are ambiguous most of the common names used by the traders can be understood today.

A second interesting point of significance to the historic archeologist is the relative frequencies of bead types in the yearly inventories of the outfits. It is clear that certain types such as wampum and seed beads were being traded to Indians in great quantities through time and across a fairly broad geographic area. Such types would appear to have little significance in interpreting sites in terms of culture or time. On the other hand the presence or absence of black beads, fancy beads, certain types of garnets, blue beads, etc. may prove to be more useful for temporal and cultural identification. The differential value of certain types of beads, as indicated by the price information in the records, is also of significance when analyzing a bead collection from an

archeological site. The relative frequency of different types will in part depend on the cost of each type. If the connection between trade records and beads found archeologically can be established, potentials for understanding dynamics such as social status of individuals (e.g. study of beads found with burials) may be greatly clarified.

Since there is consistency in bead nomenclature in the trade records, and since the terms used to distinguish different types of beads is fairly precise, it should be possible with thorough investigation to make excellent use of this kind of documentary evidence. There do seem to be significant differences in the bead type frequencies between the various outfits and within individual outfits there are differences through time. A major breakthrough in maximizing the potential of trade beads for historic archeology would be a study of records from broadly separated geographic areas. A major problem in comparing sites from different regions is the fact that each area may have experienced the introduction of the same type of bead at different points in time. Thus, coincidence of archeologically recovered types, does not necessarily indicate contemporaneity between widely separated sites. This kind of problem could be solved with the proper kind of documentary research.

The Manufacturing Processes and Classification of Glass Trade Beads

Approaching the topic of trade beads from an archeological perspective and particularly noting the absence of extensive

documentary research, it is clear that a necessary initial step toward increasing the potential of this artifact type is establishing a classificatory system whereby beads from sites can be compared with some degree of precision. Until very recently, describing beads has proven to be frustrating for most archeologists and to date no satisfactory scheme for classification has been offered which has found wide acceptance (Kidd and Kidd, 1970: 46). Even the terms used by people in describing beads from various sites have been vague, imprecise and usually ambiguous. Furthermore, when beads are described in most site reports, the methods used in presenting the information often displays a lack of organization and logical order. The combination of poor terminology and lack of a systematic method of presenting data makes comparisons most difficult.

In the past few years the studies of Lyle Stone (1970) and Kenneth and Martha Kidd (1970) have attempted to standardize trade bead description and classification. While the two schemes developed differ in several respects, the fundamental principle used is the same. Basic to the classification procedures outlined by Stone and Kidd and Kidd is analysis according to formal, physical properties of glass beads which reflect manufacturing processes. These properties are empirical, verifiable entities by which any specimen can be subjected to examination and compared to any other specimen (Kidd and Kidd, 1970: 47). Neither of these systems attempts to represent past reality through classificatory taxonomy. Stone's classification scheme is meant to be an

analytical tool useful in evaluating the significance of variation within the spatial, temporal and formal dimensions of a site (Stone, 1970: 42). He notes that the differences distinguished in this type of "formal classification" may not have been recognized through time and in different social and cultural contexts. In spite of this fact, the formal classification system does allow for the isolation of differences which do have analytical significance at the present time (Ibid.). Kenneth and Martha Kidd view their classification system primarily as a means of permitting exact description of all beads found in archeological excavations (Kidd and Kidd, 1970: 49). Implicit in their system, however, is the aim that once beads are so described, comparison of various assemblages will reveal cultural and/or temporal dynamics.

Since the bead classification systems are so intimately related to manufacturing processes, it is necessary to briefly review some of the major features of the 17th-19th century glass bead industry (see Kidd and Kidd, 1970, Stone, 1970, Good, 1972), before continuing the discussion of classification.

Most of the trade beads found in North America during the historic period were manufactured in glass factories of Murano, Venice (Woodward, 1965: 4). Generally, the beads were manufactured by one of two major methods: Hollow-cane (drawn) or Wire- (Mandrel) Wound. Each method resulted in beads which had certain distinguishable characteristics. In both methods the initial step is to heat a mass of glass ingredients to a molten state and, when desired, add coloring pigments to the mixture.

In the Hollow cane method, the next step in manufacture is to introduce a bubble into the mass either by stretching and folding or by blowing air into the mass through a hollow blowing rod. The bubble is then re-immersed into molten glass which may be of the same or a different color (in which case the process is called layering). Next a second rod is attached to the mass and the two are pulled apart or drawn until the glass becomes cool and will not pull out further, forming a hollow cane of glass which may be 250 or over 300 feet long. The perforation and width of the rod is relatively constant the entire length of the rod. The rigid tube or glass is laid down on slabs of wood to cool and then broken into short lengths which are finally chopped into sizes which will serve as beads.

Although beads may be left in this basically simple state with no further modifications, there are a number of other steps which can be followed to decorate or shape beads. Inlays of canes or rods of colored glass may be introduced to form striped beads. In this process rods of the desired color are arranged around the inside wall of a pail-like container. The bubble, prior to drawing, is introduced into the center of the bucket and expanded so that the rods adhere to it. Then the mass is re-heated just long enough to cause the rods to coalesce with the surface of the bubble and still maintain their form. The mass is drawn as described above and will produce striped beads. Each stripe may be composed of just a single rod or several rods of different colors. During the drawing process, the rod may be

twisted. In striped beads the twisting will produce a spiral effect much like a barber pole. Another method of shaping the bead is to lay the bubble (whether layered, striped, etc.) on a marble board or "marver" and either flatten the bubble or paddle it to create a rod which is triangular, square or polyhedral in cross section. When the bubble is drawn, the finished tube will retain the shape given it on the marver.

Beads may also be shaped and/or finished by tumbling the glass segments cut from the drawn rod. These segments are tumbled in a metal container with a mixture of ground charcoal and fine sand which fills the orifices of the beads and prevents the collapse of the rod when the container is re-heated. The container is constantly agitated on an eccentric axle so that the beads do not fuse together. This action, in conjunction with heating, reduces beads to various globular or rounded shapes. Finally, when cool, the beads are separated from the charcoal and sand mixture and then washed and sometimes agitated in bags of bran to produce a polished surface.

Whether left in the simple tube form or tumbled into various shapes, the finished products are sorted by size in sets of graded sieves and defective specimens are removed.

In the wire or Mandrel-wound method of manufacturing glass beads, no air bubble is introduced into the original mass of glass. Instead, a mass is drawn to form a long rod without a perforation. The cane is broken into smaller segments and then a segment is re-heated with a glass blowing lamp. A thread is

started from the segment which is wound around an iron or copper mandrel (wire) which has also been heated and covered with chalk or some similar substance to facilitate removal of the finished product. The thread or strand of molten glass is wound around the wire until a bead of the desired size and shape is built up. Several different colored threads might be added to produce multi-colored beads or glass insets may be placed in various designs in the still molten glass on the mandrel. In this sense, as compared to the hollow-cane beads, each specimen is individually handicrafted though several beads could be made on a single mandrel. After the molten glass has cooled, the bead or beads are removed from the wire and may be tumbled in the usual manner. Beads manufactured by this method usually display circular striations where the strands have been wound around the wire. This is one certain indicator of the manufacturing technique, for such a feature will not occur on beads made by the drawn or hollow cane method. On the latter type of beads, a characteristic feature is longitudinal striations created from air bubbles in the glass which get drawn out when the rod is formed. Generally, air bubbles in the mandrel wound beads are circular rather than elongated.

In discussing manufacturing techniques it should be mentioned that control of ingredients was somewhat haphazard (Kidd and Kidd, 1970: 50). This results in considerable variation in the quality of the glass itself and perhaps more importantly, considerable variability in color. The craftsmen knew what chemicals would produce various colors but the purity of the coloring chemicals

was not well controlled. Therefore, consistency in color can not be expected. Shapes of beads may also be quite irregular due to the tumbling procedures used. So shape, like color, may be a physical property of beads which is quite variable. Finally, certain surface characteristics of glass beads such as air bubbles, longitudinal and concentric striations, scratches, pits, small cracks and so on are adventitious rather than intentional products of the manufacturing processes. These comments have particular relevance when beads are classified according to physical properties. That is, when noting the physical characteristics of beads and attaching significance to them for purposes of classification, it is important to distinguish between those features which reflect intentionality of the glass-makers and those which are, instead, reflections of the imperfection of certain manufacturing procedures. One aspect of bead manufacture which apparently was fairly well controlled has to do with creating beads of different sizes. Arthur Woodward, quoting an article in Scientific American published in 1856 reports (Woodward, 1965: 7):

> This operation is performed by men, women and boys--who have before them an iron gauge into which with one hand they thrust fifteen or twenty tubes at the same time, and with an iron instrument (resembling a hatchet head) in the other hand, they rapidly chop off the ends of the tubes, according to the size adjusted to the gauge. The cuttings are then taken below where they are put into an iron barrel along with some sand and placed in a furnace over a pretty hot fire . . . until the sharp edges are properly shaped. . . .

This information suggests that in classifying beads size clustering may have considerable significance. Intensive study of the documentary sources might determine if this precision in sizing beads was typical in earlier time periods or only a feature of bead manufacture in the latter part of the 19th century. Such data could be very helpful to the archeologist working with excavated bead samples.

Analysis of Beads from Crabapple Point

Physical proporties which result from manufacturing processes were the basic classificatory attributes utilized in analysis of the trade beads from Je 93. In this study certain principles followed by the Kidds and others presented by Lyle Stone have been synthesized and re-combined. This synthesis has led to a third system which has the simple, yet systematic organization of the Kidds' scheme as well as the clarity and precision of Stone's work. As already mentioned, both classificatory devices call for the sorting of beads according to physical properties. The two different systems are briefly outlined here so that the logic of the scheme used in the present analysis can be better understood.

Lyle Stone, working with a bead assemblage from Fort Michilimackinac in Emmett County, Michigan, uses a formal classification system which has four levels of taxonomic differentiation, ranked hierarchically on the basis of the relative importance of physical properties (see Stone, 1970: 291-294). Beads would initially be separated into 2 Classes (I & II) on the basis of

the technique of manufacturing--either hollow-cane or mandrel-wound. Next they would be sorted into one of 4 Series (A-D) on the basis of structure:

A. Simple - composed of beads manufactured from canes made of one layer of glass.

B. Compound - beads made from canes of two or more layers of glass.

C. Complex - specimens which display applique or inset designs.

D. Composite - specimens which are both compound and complex.

Once placed into a series, beads are next grouped into Types (i-n) on the basis of a combination of shape and surface characteristics. Finally, within each type, Varieties are defined on the basis of differences in glass color, number, color and form of glass applique, degree of translucency and so on.

The Kidd system differs significantly from Stone's in terms of the organization of the taxonomic system. Based on a large collection of beads from throughout the eastern United States, their scheme attempts to reflect the logical progression of manufacturing techniques. In the Kidd Classification, beads are initially divided into two broad groups depending on the method of manufacture: hollow-cane or mandrel wound. Next, they are placed into one of four classes (I-IV), if hollow-cane, and three classes (WI-WIII), if they are mandrel-wound. The 7 classes in the system can be outlined and defined as follows:

CLASS I - The simplest form of monochromatic, tubular beads which may or may not have adventitious surface decoration (e.g. applique or insets). The forms may have been

twisted or shaped on a marver prior to drawing the rod. (This class would include Stone's Class I, Series A or C.)

CLASS II - beads derived from Class I but have been shaped by re-heating and tumbling (Stone's Class I, Series A or C).

CLASS III - beads derived from Class I but which have been made from canes composed of two or more layers of glass (Stone's Class I Series B or D).

CLASS IV - beads derived from Class III forms but, as in the case with Class II have been shaped by re-tumbling (Stone's Class I, Series B or D).

CLASS WI - Mandrel-wound beads of simple shapes (e.g. round, oval, donut) and monochrome color (Stone's Class II).

CLASS WII - Mandrel-wound beads of more elaborate shapes (pinched or molded) and monochromatic (Stone's Class II).

CLASS WIII - Mandrel-wound beads of any shape but which have adventitious surface decoration of contrasting colors (Stone's Class II).

It is at the point of sorting beads into types and varieties that the Kidd system, while logical, becomes somewhat clumsy and difficult to follow compared to the formal classification system of Lyle Stone. Once sorted into classes, wire-wound beads of classes WI and WII are placed into types on the basis of shape. WI types are monochrome beads of various shapes (e.g. WIa is oval). WII beads of more complex shapes are again placed into different types on the basis of shape variability. WIII beads are typed according to the nature of the decorative elements present. Typing beads of the hollow-cane classes according to the Kidd system proceeds according to a systematic, developmental order which is most clearly understood by examining the bead charts included in

their report. Types are essentially ordered from simple to complex within each class. Furthermore, bead types which are directly derived from a preceding type can be designated in such a manner that this relationship is clear (e.g. Ib, Ibb, Ib'). This allows the system itself to reflect the degree of similarity and difference between various types.

Varieties of the types within the system are defined on the basis of differences in size, glass color, and when relevant stripe color, number of rods per stripe, etc. Varieties are given numbers such as Ia1, Ia2, Ibb'1, etc.

The major weakness of the Kidd system is that they are advocating the use of their system for every collection studied. That is, they would have all investigators fit bead specimens directly into their system, using their numbering scheme and simply adding to it when new types are discovered. This would, of course, mean that in every report, the Kidd bead charts and tables would have to be included. Obviously, without such an inclusion, readers would never understand the significance of designations such as IIIbb'39. It is unlikely that in any one collection the developmental order presented in the Kidd report would be present. Without samples of each type-variety presented by the Kidds the logic of the system is not obvious. Furthermore, the similarity of types within a single assemblage would be obscured by using their numbering system.

An example of the difficulty in using the Kidd system is the Matthews Site report (Clinton County, Michigan), by Charles

Cleland (1972). In his discussion of 4 historic burials and the accompanying grave goods, Cleland mentions that the beads with one burial resemble Kidd and Kidd's type If3. Other beads with the same burial, he comments, are referable to the Kidds' type 11a36 and 11a61 respectively (182-184). One can only assume that an editorial or typographical error occurred in designating these last two types since in the system a designation such as 11a36 would be impossible. Presumably the proper numbering would be IIa36. The point, however, is that without having the Kidd's work available, Cleland's references have very little meaning, especially since the beads are not well described in the report ("light blue and rose amber seed beads"). This kind of mis-use of the Kidds' system will surely not facilitate comparison between sites.

In summary, the two classification systems outlined have certain deficiencies and certain strengths. Stone's system, when compared to the Kidds' presents a very precise scheme for defining taxonomic units and for placing beads into those units. The system, however, suffers from a lack of organizational logic such as that presented in the Kidd scheme, which allows for the ordering of taxonomic units in a manner which, in and of itself reflects degrees of similarity and the relationships between various classes and types. The Kidds have also diminished the judgmental problem inherent in Stone's work of having to weigh the relative significance of various physical properties. The major difficulty with the Kidd taxonomy aside from their own

inadequate explication, is the suggestion that their system, as is, be used in classifying all bead assemblages. This seems to be an unnecessary and cumbersome procedure. It is far less complicated and more illuminating to use the principles of their system with a collection, while establishing a separate numbering system so that the relationships of beads within a single collection can be demonstrated.

Beads from Crabapple Point

All glass beads from Je 93 were examined under a binocular microscope using artificial light of a consistent intensity. Initially each bead was given a number and provenience designation and the following information was noted:

1. Metric Dimensions

   Length: Maximum distance between the ends.

   Width: Maximum distance across the center of the bead, perpendicular to the length.

   Bore: The diameter of the bore was measured with a graduated set of Singer sewing machine needles sizes 9, 11, 14, 16, 18, and 21 and then converted to millimeters, 0.4 - 1.4. When larger than 1.4mm. bore size was measured directly through the use of a microscopic micrometer.

2. Color

   In most studies the Munsell Color Chart designations are used in describing bead color. This source was not available for use. Fortunately there was very little color variation within this assemblage so that common terms for color were used for descriptive purposes.

3. Shape

In all reports examined, describing bead shape was one of the most difficult tasks in analysis. Part of the problem is in describing and illustrating essentially three-dimensional forms. Most reports fail to even attempt definition of shape categories used. Shape categories used in this study are presented in Figure 4.

4. Surface Characteristics

The presence (or absence) of features such as longitudinal striations, circular striations, air bubbles, cracks, scratches, glass decomposition due to weathering, patina, or pits. All of these features are either adventitious results of manufacturing or the results of exposure to soil conditions, fire, etc.

5. Tumbling

The degree to which beads were tumbled. In tubular beads this is evident in the appearance of the ends which are rough and irregular when untumbled and smooth and regular when tumbled.

6. Glass Characteristics

The colors can appear in clear, translucent or opaque glass. The glass may also be shiny and polished or somewhat dull and gritty in texture.

BEAD CLASSES - Je 93

Hollow - Cane Classes

Class I - tubular beads of simple construction which may or may not have adventitious surface decoration.

Class II - beads of simple construction derived from Class I but shaped through re-heating and tumbling. They may or may not have adventitious surface decoration.

Class III - tubular beads of compound (2 or more layers of glass on the initial rod) construction which may or may not have adventitious surface decoration.

Class IV - beads of compound construction derived from Class II but shaped through re-heating and tumbling. They may or may not have adventitious surface decoration.

Figure 4

BEAD SHAPES

A. Tubular: Cylindrical beads where the width measurement is constant, regardless of the point along the length at which the bead is measured.

B. Oval: The width is greatest in the center of the bead, tapering equally toward each end.

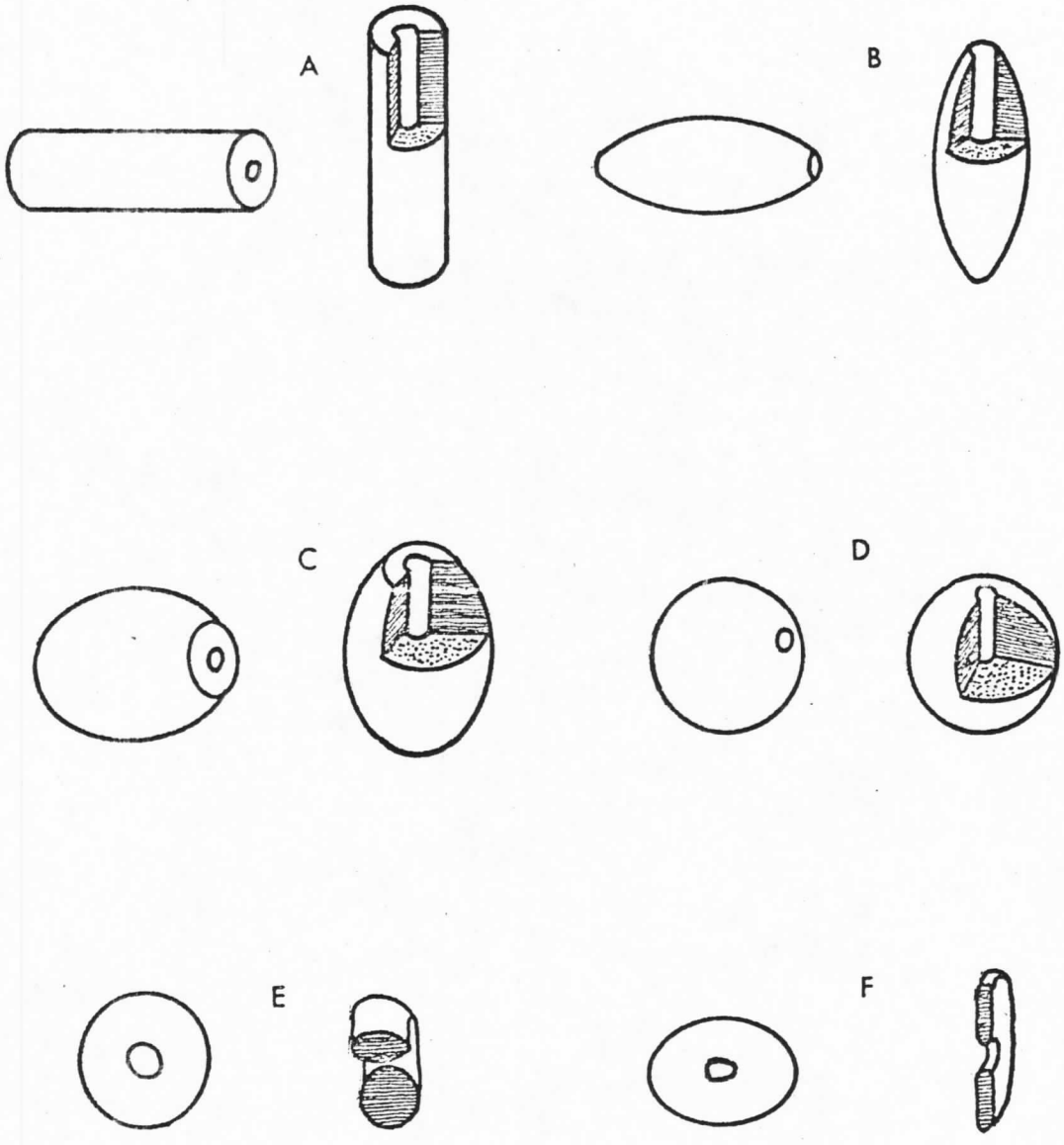
C. Barrel: Intermediate between tubular and oval beads. The widest point of the bead is in the center, tapering slightly toward each end. The ends tend to be flattened.

D. Round: The length and the width are approximately equal. The specimens are spherical with every point on the circumference equidistant from the center.

E. Donut: Beads which are wider than long. In cross-section the beads appear donut-shaped. The bore of the bead is slightly depressed into the body of the bead.

F. Circular: Thin, flat beads which are circular in outline.

Figure 4



Wire-Wound Classes

Class WI - wire wound beads of simple shape. These are monochrome and lack surface decoration.

Class WII - wire wound beads of simple shape with surface decoration.

The wire wound beads are placed into classes primarily on the basis of shape and the presence or absence of surface decoration as in the Kidds' system. However, in this collection there were no specimens which would have been included in their Class WII (complex shapes). Class WII in this study would correspond to their Class WIII.

The further sub-division of bead classes into Types was based on criteria of size, shape or color. With this particular assemblage it was not feasible to adhere to a rigid set of type-criteria without considerable taxonomic distortion (see Stone, 1971 for a similar case). It was also impossible to follow the precise, logical progression of types within classes as presented in the Kidd system. Many of the types which are included in their classification simply were not present in this collection. To use their numbering system would have resulted in a very confusing picture of the present assemblage and would have made the task of comparing this sample to others unnecessarily complicated. Therefore, beads were ordered, when possible, according to the level of complexity of the types within each class and designated in a manner intended to show the degree of relatedness between the types. For example, in Class I, types Ia and Iaa are more similar to each other than they are to type Ib.

Varieties of each type were defined again on the basis of differences in size, shape or color. A summary of the taxonomy of

beads from Je 93 is presented in Table 4. Description of the bead types is given in Table 5.

NON-GLASS BEADS Je 93

2 shell beads and 1 brass bead were found at Crabapple Point. All of the specimens were found in Feature 10.

Brass Bead - Tubular

A tubular bead made of rolled brass was 17 mm. long, 4.5 mm. wide with a bore 3.0 mm. wide. The original sheet of brass was 5 mm. thick. It closely resembles the sheet brass strips found in the fill of Feature 10.

Shell bead - Tubular, white - wampum bead of very hard clam shell

This specimen, broken longitudinally, very closely resembles glass beads of Variety IIIa2. It is 4 mm. long, 3.0 mm. wide with a bore approximately .9 mm. wide. The ends of the specimen are smooth, flat and regular and appear to have been cut and ground.

Shell bead - Oval-Barrel, pink

This very fragile specimen was fashioned from a pink shell into an ovoid shape. The material was decomposed to the point that the bead began to disintegrate when excavated. It resembles in form the wire wound beads of oval shape. The specimen is 6.5 mm. long, 5.0 mm. wide with a bore of 1.4 mm.

Comparisons and Discussion

The bead assemblage from Crabapple Point was compared to collections from nine other historic sites ranging in time from 1670-1850, in an attempt to establish the temporal boundaries of the site occupation. All of the sites have been dated through the use of diagnostic artifacts other than beads or documentary evidence. The sites selected for comparative purposes are located within a limited geographic region. While this kind of

TABLE 4

BEADS FROM Je 93 - SUMMARY OF DATA

Hollow Cane

CLASS	TYPE-VARIETY	DESCRIPTION	# OF SPECIMENS
I	a-1	Color: Dark Red - translucent Form: tubular Size: Length: 4.0 mm. - 5.0 mm. Width: 2.0 mm. - 3.5 mm.	39
I	a-2	Color: Dark Red - translucent Form: tubular Size: Length: 2.5 mm. - 3.5 mm. Width: 2.0 mm. - 3.5 mm.	39
I	a-3	Color: medium blue translucent Form: tubular Size: Length: 2.5 mm. - 5.5 mm. Width: 2.5 mm. - 3.5 mm.	13
I	b-1	Color: medium blue opaque with white/red/white longitudinal stripes Form: tubular Size: Length: 15.5 mm. Width: 5.0 mm.	1

Hollow cane (continued)

CLASS	TYPE-VARIETY	DESCRIPTION	# OF SPECIMENS
I	aa-1	Color: Dark red translucent Form: tubular with 2 facets Size: Length: 4.0 mm. Width: 3.0 mm.	1
II	a-1	Color: Dark red translucent Form: donut Size: Length: 2.0 mm. - 3.0 mm. Width: 2.5 mm. - 4.0 mm.	8
II	a-2	Color: Medium blue translucent Form: donut Size: Length: 2.0 mm. Width: 3.0 mm.	1
II	a-3	Color: Medium blue translucent Form: barrel Size: Length: 2.0 mm. Width: 3.0 mm.	1
II	a-4	Color: Blue-green opaque Form: barrel Size: Length: 2.5 mm. Width: 2.5 mm.	1

Hollow cane (continued)

CLASS	TYPE-VARIETY	DESCRIPTION	# OF SPECIMENS
III	a-1	Color: Clear/opaque white Form: tubular Size: Length: 2.0 mm. - 3.5 mm. Width: 2.0 mm. - 3.5 mm.	87
III	a-2	Color: Clear/opaque white Form: tubular Size: Length: 3.5 mm. - 5.5 mm. Width: 2.5 mm. - 4.5 mm.	79
III	b-1	Color: Opaque red/light green transparent Form: tubular Size: Length: 2.5 mm. - 3.0 mm. Width: 3.0 mm.	3
IV	a-1	Color: Clear/white opaque Form: donut Size: Length: 1.5 mm. - 3.0 mm. Width: 2.5 mm. - 4.0 mm.	36
IV	a-2	Color: Clear/opaque white Form: Barrel Size: Length: 3.0 mm. - 3.5 mm. Width: 3.0 mm. - 4.0 mm.	37

Hollow cane (continued)

CLASS	TYPE-VARIETY	DESCRIPTION	# OF SPECIMENS
IV	a-3	Color: Clear/white opaque Form: circular Size: Length: 1.5 mm. - 2.0 mm. Width: 2.5 mm. - 3.0 mm.	2
IV	a-4	Color: Clear/white opaque Form: round Size: Length: 3.0 mm. Width: 3.5 mm.	1
IV	a-5	Color: Clear/white opaque Form: irregular donut - circular Size: Length: 2.0 mm. Width: 3.0 mm.	1
IV	b-1	Color: Red opaque/light green transparent Form: barrel Size: Length: 2.5 mm. - 3.0 mm. Width: 3.0 mm. - 4.0 mm.	3
IV	bb-1	Color: Clear/opaque red/transparent light green Form: barrel Size: Length: 2.5 mm. Width: 3.5 mm.	1

	CLASS	TYPE-VARIETY	DESCRIPTION	# OF SPECIMENS
Hollow cane (continued)	IV	bb-2	Color: Clear/opaque red/transparent light green Form: donut Size: Length: 2.5 mm. Width: 4.0 mm. - 4.5 mm.	2
Wire-Wound	WI	a-1	Color: Opaque white Form: oval Size: Length: 4.5 mm. - 9.0 mm. Width: 2.5 mm. - 5.0 mm.	18
	WI	a-2	Color: Opaque white Form: round-asymmetrical Size: Length: 3.5 mm. - 5.0 mm. Width: 3.5 mm. - 5.0 mm.	4
	WI	a-3	Color: Mulberry opaque Form: oval Size: Length: 6.0 mm. - 7.0 mm. Width: 3.5 mm. - 4.0 mm.	4
	WI	a-4	Color: Mulberry opaque Form: round - asymmetrical Size: Length: 4.0 mm. - 4.5 mm. Width: 1.4 mm. - 2.0 mm.	2

Wire-Wound (continued)

CLASS	TYPE-VARIETY	DESCRIPTION	# OF SPECIMENS
WI	a-5	Color: Altered to dark grayish-brown Form: oval Size: Length: 4.0 mm. - 9.0 mm. Width: 2.5 mm. - 4.5 mm.	6
WII	a-1	Color: Opaque white with gold band inlay Form: oval (broken in 1/2 longitudinally) Size: Length: 8.5 mm. Width: 8.0 mm. Decoration: gold-yellow glass rod inset around the middle of the bead	1

Table 5

BEAD TYPE DESCRIPTIONS - Je 93

CLASS I - Type Ia

Simple, tubular, monochromatic beads

Variety Ial (39 specimens) - Dark Red, translucent

These beads appear to be black in color until subjected to intense light, when the dark red color is evident. Most of the specimens have a somewhat gritty texture and dull appearance though some are smooth and glassy. A few specimens are slightly iridescent and display a patina. Based on their provenience, this feature appears to be the result of exposure to fire.

Over half of the specimens show some degree of tumbling in that the ends are smooth and regular (45% are untumbled). Scratches, air bubbles, longitudinal striations appear in various combinations or singly on most of the specimens of this type.

Metric dimensions (all measurements in mm.)

Length:	Width:	Bore:
4.0 ..... 71%	2.0 ..... 13%	.4 ..... 9.6%
4.5 ..... 16%	2.5 ..... 29%	.6 ..... 6.4%
5.0 ..... 13%	3.0 ..... 52%	.7 .....19.3%
	3.5 ..... 6%	.8 ..... 3.2%
		.9 ..... 3.2%
		1.0 ..... 9.6%
		1.1 ..... 6.4%
		1.2 .....12.9%
		1.3 .....29.0%

Variety Ia2 (39 specimens) - Dark Red translucent

These beads are in all respects, except size, identical to Ial.

Metric dimensions

Length:	Width:	Bore:
2.5 ..... 2%	2.0 ..... 8%	.4 ..... 2.6%
3.0 ..... 24%	2.5 ..... 63%	.6 ..... 2.5%
3.5 ..... 74%	3.0 ..... 24%	.7 ..... 15.7%
	3.5 ..... 5%	.8 ..... 7.8%

Metric dimensions (continued)

Length:	Width:	Bore:
		.9 ..... 13.1%
		1.0 ..... 18.4%
		1.1 ..... 5.2%
		1.2 ..... 10.5%
		1.3 ..... 13.1%
		1.4 ..... 10.5%

Variety Ia3 (13 specimens) - Medium blue translucent

Beads of this variety closely resemble Ia1 and Ia2 except that they are translucent blue in color. Over half the specimens in this variety are untumbled displaying rough ends. Most of these beads have a smooth, glossy appearance and only one displays any sign of patination. All specimens exhibit certain surface features such as scratches, cracks and small pits and longitudinal striations occur in all of the beads and are made conspicuous because of the translucency of blue glass.

Metric dimensions

Length:	Width:	Bore:
3.5 ..... 33.3%	2.5 ..... 41.6%	.7 ..... 8.3%
4.0 ..... 16.6%	3.0 ..... 50.0%	.8 ..... 25.0%
4.5 ..... 33.3%	3.5 ..... 8.3%	1.0 ..... 8.3%
		1.1 ..... 8.3%
		1.2 ..... 16.6%
		1.3 ..... 16.6%
		1.4 ..... 16.6%

CLASS I - Type Ib

Simple, tubular with complex stripes

Variety Ib1 (1 specimen) Opaque medium blue with stripes (white/red/white)

This one striped, blue bead has 6 stripes, each of which is composed of glass canes alternating in color from white to red to white. Each of the stripes is 1.4 mm. wide--the two white canes are .4 mm. and the red cane 6 mm. in width. The bead has not been tumbled.

Metric Dimensions

Length: 15.5 mm. Width: 5.0 mm. Bore: 2.0 mm.

CLASS I - Type Iaa

Variety Iaa1 (1 specimen) Dark Red translucent with 2 facets

This bead is identical to beads of variety Ia2, except for the presence of 2 flattened areas or facets on the body of the bead. These may have been unintentional mistakes in the manufacturing process or may have been created by flattening these areas on a board or marver. The bead ends have been smoothed by tumbling and the texture of the specimen is somewhat gritty. The surface is slightly scratched and air bubbles are visible.

Metric Dimensions

Length: 4.0 mm. Width: 3.0 mm. Bore: 1.2 mm.

CLASS II - Type II a

Simple, shaped, monochromatic

Variety IIa1 (8 specimens) - donut shaped, Dark Red translucent

Beads of this variety are derived from Ia types. All specimens have been tumbled into a donut shape, are dull and somewhat gritty in texture and with the exception of the presence of tiny air bubbles, have no other surface marks.

Metric Dimensions

Length:	Width:	Bore:
2.0 ..... 25%	2.5 ..... 25%	.6 ..... 25%
3.0 ..... 75%	3.0 ..... 50%	.9 ..... 25%
	2.5 ..... 25%	1.2 ..... 25%
		1.4 ..... 25%

Variety IIa2 (1 specimen) - donut shaped, medium blue, translucent

This specimen is derived from Ia3 types and differs from them in that the bead was subjected to tumbling which created a bead of donut shape. The one example from the site is glossy and smooth in texture and displays a few air bubbles on each end.

Metric Dimensions

Length: 2.0 mm. Width: 3.0 mm. Bore: 0.9 mm.

Variety IIa3 (1 specimen) - Medium Blue translucent - barrel shaped

This type is also derived from Ia3 types and differs because of the degree of tumbling. The texture of this specimen is somewhat gritty and dull. There are no surface marks on the bead.

Metric Dimensions:

Length: 2.0 mm. Width: 3.0 mm. Bore: 0.4 mm.

Variety IIa4 (1 specimen) - Blue-green opaque - barrel shaped

The specimen is a type derived from Ia type beads, none of which occur in this blue-green color at Je 93. The surface of the specimen is dull and gritty and longitudinal striations, air bubbles and scratches are present.

Metric Dimensions:

Length: 2.5 mm. Width: 2.5 mm. Bore: 0.6 mm.

CLASS III - Type IIIa

White tubular beads of compound structure*

(* only with magnification did it become apparent that all of the white beads in this collection of hollow-cane manufacture, had a thin veneer of clear glass over the white glass. Otherwise, the beads would have been placed in Classes I or II.)

Variety IIIa1 (87 specimens) - White tubular beads, small

These beads all have a thin veneer of clear glass over opaque white. Over 75% of the sample have had the ends smoothed by tumbling. Generally the beads are longer than wide or equal in length-width ratio. Many of the beads are scratched and most display air bubbles and longitudinal striations. A few of the examples are slightly patinated and iridescent, presumably (based on provenience) a result of contact with fire. A few of these beads are cracked or pitted and 10 display no surface marks at all. Most of the sample are dull and somewhat gritty in texture though many are glossy and polished in appearance.

Table 5

Metric Dimensions

Length:	Width:	Bore:
2.0 ..... 1%	2.0 ..... 2%	.4 ..... 5.8%
2.5 ..... 18%	2.5 ..... 38%	.6 ..... 5.8%
3.0 ..... 47%	3.0 ..... 47%	.7 ..... 26.7%
3.5 ..... 34%	3.5 ..... 13%	.8 ..... 8.1%
		.9 ..... 9.3%
		1.0 ..... 10.4%
		1.1 ..... 8.1%
		1.2 ..... 9.3%
		1.3 ..... 11.6%
		1.4 ..... 4.6%

Variety IIIa2 (79 specimens) - White tubular beads, medium size

These beads are identical to IIIa1 with the exception of size dimensions. In addition to being generally larger than IIIa1 beads there is also a tendency for the beads to be longer than wide (94% of the sample). None of the specimens were patinated though the other surface characteristics noted for IIIa1 were present in these beads.

Metric Dimensions

Length:	Width:	Bore:
3.5 ..... 3.5%	2.5 ..... 8%	.4 ..... 7.5%
4.0 ..... 48.0%	3.0 ..... 48%	.6 ..... 2.5%
4.5 ..... 22.0%	3.5 ..... 16%	.7 .....10.1%
5.0 ..... 23.0%	4.0 ..... 23%	.8 .....10.1%
5.5 ..... 3.5%	4.5 ..... 5%	.9 .....13.9%
		1.0 ..... 5.0%
		1.1 ..... 7.5%
		1.2 ..... 5.0%
		1.3 .....25.3%
		1.4 .....12.6%

CLASS III - Type IIIb

Red/light Green Tubular beads of compound structure

Variety IIIb1 (3 specimens) - Opaque Red tubular

These beads have an inner core of light green transparent glass overlain with dull, opaque red glass. In each case the ends have been slightly tumbled to smooth the surfaces. These beads are commonly called Cornaline d'Aleppo. Air bubbles are very conspicuous at the ends of the beads and all examples have

Table 5

Variety IIIb1 (continued)

longitudinal striations.

Metric Dimensions

Length:	Width:	Bore:
2.5 ..... 33.3%	3.0 ..... 100%	.9 ..... 66.6%
3.0 ..... 66.6%		1.2 ..... 33.3%

CLASS IV - Type IVa

White, shaped beads of compound structure

Variety IV a1 (36 specimens) - White, donut shaped beads

This type of bead is derived from IIIa types but the shape has been produced through reheating and tumbling of the tubular forms. As was the case with IIIa types the beads have a thin clear veneer of glass over the opaque white glass. Most of the beads have a dull, gritty surface and display scratches, air bubbles and occasionally cracks, pits and longitudinal striations.

Metric Dimensions

Length:	Width:	Bore:
1.5 ..... 14%	2.5 ..... 30.5%	.4 ..... 19.4%
2.0 ..... 50%	3.0 ..... 41.5%	.6 ..... 16.6%
2.5 ..... 28%	3.5 ..... 17.0%	.7 ..... 11.1%
3.0 ..... 8%	4.0 ..... 11.0%	.8 ..... 11.1%
		.9 ..... 13.8%
		1.0 ..... 16.6%
		1.1 ..... 2.7%
		1.2 ..... 5.5%
		1.3 ..... 2.7%

Variety IVa2 (37 specimens) - White, barrel shaped beads

This type closely resembles IVal except that the shape is somewhat different with the widest point of the bead being in the middle and the width tapering slightly toward the ends. The ends of the beads tend to be flat rather than rounded when compared to IVal varieties. These beads are derived from IIIa types and have been shaped through re-heating and tumbling into the barrel-shape. Scratches, air bubbles, cracks, pits, and striations occur on many of the beads.

Table 5

Metric Dimensions

Length:	Width:	Bore:
2.0 ..... 24%	2.0 ..... 5.5%	.4 ..... 8.1%
2.5 ..... 54%	2.5 ..... 13.0%	.6 ..... 8.1%
3.0 ..... 19%	3.0 ..... 49.0%	.7 ..... 32.4%
3.5 ..... 3%	3.5 ..... 2.7%	.8 ..... 16.2%
	4.0 ..... 5.5%	.9 ..... 8.1%
		1.0 ..... 5.4%
		1.1 ..... 10.8%
		1.3 ..... 8.1%
		1.4 ..... 2.7%

Variety IVa3 (2 specimens) - White, circular-shaped beads

These round, flat beads are dull and gritty in texture. Like the other beads of this type they have a clear veneer over the opaque, white glass. Both specimens have air bubbles and longitudinal striations on or near the surface of the glass. One of the specimens is slightly iridescent.

Metric Dimensions

Length:	Width:	Bore:
1.5 mm., 2.0 mm.	2.0 mm., 3.0 mm.	.7 mm., .9 mm.

Variety IVa4 (1 specimen) - White, round bead

This bead resembles the other IVa varieties except that it is round in shape. The surface of this specimen was cracked, scratched and a few air bubbles were visible. The surface texture was gritty and dull in appearance.

Metric Dimensions

Length: 3.0	Width: 3.5	Bore: .4

Variety IVa5 (1 specimen) - White, irregular shaped bead

This bead was like other IVa type varieties except that the shape was irregular. The bead was on one side rather donut shaped and on the other side more circular in appearance. This was undoubtedly a manufacturing irregularity rather than an intentional outcome of manufacturing. The surface of the bead was smooth and glossy with a few bubbles present on the ends of the specimen.

Table 5

Metric Dimensions

Length: 2.0 Width: 3.0 Bore: .9

CLASS IV - Type b

Red/light Green shaped beads of compound structure

Variety IVb1 (3 specimens) - Red/light green barrel shaped beads

This variety is derived from Class III type b but has been shaped into a barrel form by means of re-heating and tumbling. The specimens all have a dull opaque red surface over a transparent light green core and all display longitudinal striations and air bubbles. This is another kind of Cornaline d'Aleppo bead.

Metric Dimensions

Length	Width:	Bore:
2.5 mm. (2 specimens)	3.0 (1 specimen)	.6 (1 specimen)
3.0 mm. (1 specimen)	3.5 (1 specimen)	.8 (1 specimen)
	4.0 (1 specimen)	1.5 (1 specimen)

CLASS IV - Type bb

Clear/opaque Red/light Green shaped beads of compound structure

Variety IVbb1 (1 specimen) - barrel shaped

This bead is identical to IVb1 except that the glass rod was composed of three layers of glass: the outer layer consisted of a clear glass veneer; the middle layer of opaque red and the core or inner layer was composed of light green transparent glass. This specimen displays air bubbles, longitudinal striations and surface pits.

Metric Dimensions

Length: 3.0 Width: 3.5 Bore: 1.2

Variety IVbb2 (2 specimens) - Clear/opaque Red/transparent light green - donut shaped

This variety is identical to IVbb1 except that it is donut rather than barrel shaped. Again, in structure it is composed of three layers of glass rather than 2 as is the case with IVb

Metric Dimensions

Length:	Width:	Bore:
3.5 ... (2 specimens)	3.5 ... (1 specimen)	1.4 ... (2 specimens)
4.0 ... (1 specimen)	4.0 ... (2 specimens)	2.0 ... (2 specimens)
5.0 ... (1 specimen)	5.0 ... (1 specimen)	

Variety WIa3 (4 specimens) - Mulberry Colored Oval Beads

These beads are very much like WIa1 with the exception of the deep mulberry color which in ordinary light appears to be black. The mulberry color is practically opaque. As in other varieties of this type of bead the glass is in many cases pitted and badly weathered. Two of the specimens are covered with a grayish brown patina which easily flakes off, exposing the mulberry colored glass. Based on the provenience of these beads the patination may be the result of exposure to fire.

Metric Dimensions

Length:	Width:	Bore:
6.0 ..... 25%	3.5 ..... 25%	1.3 ..... 25%
6.5 ..... 25%	4.0 ..... 75%	1.4 ..... 50%
7.0 ..... 50%		2.0 ..... 25%

Variety WIa4 (2 specimens) - Mulberry Colored - round beads

Both of these beads are patinated. The grayish brown patination easily flakes off the surface of the beads exposing the opaque mulberry colored glass. The ends of both specimens are asymmetrical with one end being smooth and rounded while the opposite end is irregular and rough and slightly diagonal to the longitudinal axis of the bead. Both specimens are badly weathered so that the concentric striations typical of wire wound beads is almost obliterated.

Metric Dimensions

Length:	Width:	Bore:
4.0 ... (1 specimen)	3.0 ... (1 specimen)	1.4 ... (1 specimen)
4.5 ... (1 specimen)	4.0 ... (1 specimen)	2.0 ... (1 specimen)

Table 5

Variety WIa5 (6 specimens) - Wire wound Oval beads - surface altered

Six beads which are very similar to WIa1 or WIa3 were placed in a separate taxonomic unit because the glass was so completely altered that the original color of the beads was unascertainable. The surface color is very dark grayish brown and the surface texture is granular. The glass throughout is very friable. This kind of alteration would appear to be the result of exposure to intense fire or heat.

Metric Dimensions

Length:	Width:	Bore:
4.0 ..... 20%	2.5 ..... 20%	1.2 ..... 40%
4.5 ..... 20%	3.0 ..... 40%	1.4 ..... 20%
5.0 ..... 20%	4.0 ..... 20%	1.5 ..... 20%
6.0 ..... 20%	4.5 ..... 20%	2.0 ..... 20%
9.0 ..... 20%		

CLASS WII - Type a

Wire Wound, Oval - White bead with gold band inset

Variety WIIa1 (1 specimen)

The one example of this type of bead was broken longitudinally. The oval shaped white bead was decorated with an inset of yellow-gold glass placed around the circumference of the middle of the bead. The concentric striations resulting from the manufacturing technique are clearly visible.

Metric Dimensions

Length: 8.5 Width: 8.0 Bore: 3.0

selectivity reduces the number of sites which can be used in comparisons, it is a necessary control since we know that sites in broadly separated areas may have experienced the introduction of the same bead type at different points in time. The sites used in the comparative study and the bibliographic references are:

MIDDLE HISTORIC PERIOD

Site	Location	Dates	Reference
The Lasanen Site	Mackinac Co., Michigan	1670-1705	Stone, 1971
The Bell Site	Winnebago Co., Wisconsin	1680-1730	Wittry, 1963
Ft. Michilimackinac	Emmet Co.,Michigan	1715-1781	Stone, 1970
The Guebert Site	Randolph Co., Illinois	1719-1774	Good, 1972

LATE HISTORIC PERIOD

Old Birch Island Cemetery	Georgian Bay, Ontario	1750-1800	Greenman, 1951
The Crawford Farm Site	Rock Island, Illinois	1790-1810	Bluhm, 1961 and McKusick and Slack, 1962
The Ada Site	Kent Co., Michigan	1820-1850	Herrick, 1958
The Matthews Site	Clinton Co., Michigan	1820-1830	Cleland, 1972
Kipp's Post	Garrison Reservoir	1825-1835	Woolworth & Wood, 1960

Employing George Quimby's division of the Historic Period in the Great Lakes region, it will be noted that the first four sites fall within the Middle Historic Period, 1670-1760, and the last five, within his Late Historic Period, 1760-1820. In

addition to the above-mentioned sites, beads from Carcajou Point, Jefferson County, Wisconsin, were also examined. A small, and clearly unrepresentative sample of 11 beads are housed, along with other materials collected from the surface of the site, in the State Historical Society of Wisconsin museum. Approximately 20 more beads from Carcajou on exhibit at the Hoard Museum in Ft. Atkinson were also examined. The site is included because of its close proximity to Crabapple Point, and because it has traditionally been identified as the Late Historic Winnebago village of Chief White Crow (Hall, 1962: 147 and Stout and Skavlem, 1908: 82-93). This interpretation will be considered below.

In comparing bead assemblages from different sites, even within a limited geographic region, considerable caution must be exercised prior to postulating temporal interpretations. One of the weaknesses of most historic site reports examined, is the lack of critical analysis in comparing bead collections. If we are to reach the goal of establishing a bead type chronology, such carelessness must be controlled.

One difficulty encountered in comparing bead samples is the lack of standardization with respect to description and classification. In many site reports beads are poorly described and illustrated. Comparisons based on such material inevitably involve subjective decisions concerning the similarities and differences between assemblages. This problem is eliminated when color photographs of the collections are available. This

was the case in the present study for the assemblages from the Guebert and Old Birch Island sites and Ft. Michilimackinac (kindly loaned by Lyle Stone).

Another variable to be considered when comparing beads from different collections has to do with the nature of the sites themselves. Bead inventories from contemporary burial sites, military or trading posts, and open Indian village sites may differ because of socio-cultural factors rather than time of occupation. More subtle differences may be evident in contemporaneous Indian villages or burial sites because of the style preferences of different tribal groups. Finally, bead assemblages may vary because of the archeological methods used for recovery. Beads derived from surface collections, salvage operations and carefully controlled excavations may result in very contrasting samples, even if the sites themselves were occupied during the same period of time. All of the above factors indicate the necessity for critical analysis in comparing different bead assemblages. So that the inferences made in the present study can be properly evaluated, the following data concerning the sites used for comparative purposes are presented.

Site	Type of Site	Methods of Recovery and Excavation Control
Lasanen	Algonquin Burial Site	Well controlled salvage excavation.
Bell	Fox Indian Village	Limited control salvage excavation--Plow zone removed by machine.
Michilimackinac	French and British Military Post	Well controlled excavation.
Guebert	Kaskaskia Indian Village	Limited excavation--most of the sample from surface collections.
Old Birch Island	Algonquin Burial Site	Controlled excavation.
Crawford Farm	Sauk Village and Burials	Controlled excavation report unpublished; materials examined from surface collection.
Ada Site	Ottawa camp site and Burial locality	No information on excavation.
Matthews Site	Burial Locality	Excavation and notes by non-professional. Excellent notes.
Kipp's Post	Columbia Fur Co. Trading Post	Limited excavation control--Plow zone removed by machine.

In spite of the limitations presented, it is possible through comparisons with dated sites to suggest the temporal position of a given site on the basis of bead types, at least within the rather broad boundaries of Quimby's divisions of the Historic Period. For each temporal unit of the period, Quimby presents the known diagnostic bead types (Quimby, 1966: Chap. 6). For the Early Historic Period diagnostic types are

large tubular beads, star or chevron beads and beads with vertical stripes of two colors. In the Middle Historic Period, polychrome beads with straight or spiral stripes in a single contrasting color; monochrome elongate spheroids; decahedrals with eight faces; raspberry forms; large egg-shaped wire-wound forms; and spheroidal beads with fluting are typical. In the Late Historic Period fewer bead types are present due to the introduction of silver ornaments into the trade after 1760 (Ibid.: 87). Excluding the ubiquitous tiny seed beads, typical forms are oval or barrel-shaped wire-wound beads with wreaths of leaves in enamel encircling the bead equator; polka dot or eyed beads; multi-faceted forms of various colors; imitation wampum beads; small spheroidal and oblate-spheroidal beads of various colors.

Based on Quimby's work alone, the bead assemblage from Je 93 would most readily fit into the Late Historic Period. Specific comparisons with dated sites support this interpretation and furthermore suggest that the site was occupied during the early decades of the Late Historic Period. Comparative data is presented in Table 10. Included in this table is the sample size from each site, when this information is given in the original report; the percentages of each sample represented by individual types present at Je 93; the percentage of the total assemblage from each site which corresponds to the sample from Je 93.

One bead type which was not included in Table 10 is white shell wampum. Only one specimen of this type was found at Je 93.

Such beads were very common at the Lasanen Site (14,000 specimens) and the Ada Site. They represented 5.4% of the sample for the Guebert Site and 1.5% of the Ft. Michilimackinac assemblages. Shell wampum was not reported from any of the other sites investigated.

In examining Table 10, it should be noted that 97.7% of the sample from Crabapple Point was directly comparable to types found at other sites in the Great Lakes region. The only beads from Je 93 which were not present in the comparative sample are minor variants of types which are represented in other collections. Iaa1 (1 specimen) is a dark red tubular bead identical to Ia1 except for the presence on this one specimen of two facets which may have been an accidental rather than an intentional result of manufacturing. Similarly, IIIb1 (3 specimens), WIa2 (4 specimens) and WIa4 (1 specimen) are distinguishable from related varieties present in other assemblages only on the basis of shape. These bead types, apparently unique to Je 93, do not seem to be of great significance but rather are examples of the lack of precision typical of the glass bead manufacturing industry.

Comparisons of the bead assemblage from Je 93 to other sites of both the Middle and Late Historic Periods confirm the impression based on Quimby's definitions, that the site fits most readily into the Late Period. There is a conspicuous absence of certain diagnostic Middle Historic bead types at the site, specifically polychrome and striped beads; large wire-wound forms;

large spheroid and tubular monochrome beads; melon, raspberry, fluted and large faceted types and flat, disc-shaped beads. All of these types were present in the Middle Historic sites investigated. At both the Bell Site and Carcajou Point, sites geographically closest to Je 93, the beads were exclusively of the above-mentioned types and neither assemblage had forms present at Crabapple Point. Although the bead sample from Carcajou is clearly unrepresentative it does seem significant that the only diagnostic types present in both collections studied are those characteristic of the period 1670-1760, and that these same types are identical to those found at the Middle Historic Bell Site. This casts some doubt on the conclusion generally accepted, that Carcajou was the location of the 1828 Winnebago village of White Crow, unless the interpretation is amended to include an earlier, Middle Historic, component.

Comparison of the beads from Crabapple Point to other Late Historic sites suggests that the period of occupation was probably in the earlier, rather than the later decades of the Late Historic Period. Although the bead collections from the Ada and Matthews sites and Kipp's Post are somewhat less extensive than those from the Middle Historic sites, it is clear that certain types present in those sites are not found in the assemblage from Je 93. Small multi-faceted beads, tiny seed beads of various colors; small polka dot and fancy inlaid wire-wound beads, all diagnostic of the Late Historic Period, are relatively common in these sites but do not occur at Crabapple

Point. Similarly, they do not occur at Old Birch Island Cemetery or Crawford Farm, sites dated to the earlier decade of the Late Historic Period, roughly 1750-1800. It is with these two sites that the beads from Crabapple are most comparable.

The beads from the Crawford Farm Site, illustrated in McKusick and Slack (Plate 2) appear to be identical to types found at Crabapple Point. Unfortunately, the final analysis of the important site in Illinois, has not yet been published. Nonetheless, all of the beads pictured are reproduced in the Je 93 assemblage. More significant are the parallels between Old Birch Island Cemetery in Georgian Bay, Ontario and Je 93. Both collections reflect the lack of variety of bead types characteristic of the Late Historic Period, when silver ornaments had begun to replace beads, particularly necklace beads, as favored trade items. Thus, in both samples, the preponderance of types are the smaller beads used in embroidering articles of clothing. Secondly, in both collections, the most frequently occurring bead types are imitation wampum beads, i.e. small tubular varieties. At both sites these are present in white, blue and black (dark red when subjected to intense light) varieties. Next in frequency at both sites are small, white beads which have been shaped by tumbling. This kind of bead, however, has a long history of use in the Indian trade and forms the bulk of the sample at the Guebert Site and at Fort Michilimackinac.

In addition to the similarities between the two sites, it is interesting to note the differences between Old Birch Island and

Crabapple Point. Four bead types represented by 19 beads found at Old Birch Island do not occur at Crabapple Point: 14 "Man-in-the-moon" or crescent beads (blue disc-shaped beads); 3 blue ovoid beads with red stripes; 1 large elliptical white bead; and 1 large blue faceted bead. Each of these types is found at sites dating to the Middle Historic Period. The six types found at Je 93 which do not occur at Old Birch Island are: 1 red and white striped blue bead; 1 small blue-green barrel-shaped bead; 6 small "Cornaline d'Aleppo" beads; 4 mulberry, oval wire-wound and 5 brown, patinated wire-wound beads and 1 oval, white wire-wound bead with a circumferential gold inset band. These types, like the ones at Old Birch Island, are also found primarily in Middle Historic contexts.

There are two different interpretations which might explain the apparent mixture of Middle and Late Historic bead types at both Crabapple Point and Old Birch Island Cemetery. First, there may simply have been two or more occupations at each site spanning the Middle to Late time periods. At Je 93 the random distribution of bead types (see Tables 7-9) argues against this interpretation. A second hypothesis is that the sites may represent an early phase of the Late Historic Period, when beads typical of the Middle Historic period were still in use. Based on the bead assemblages alone, there would really be no reason to choose one interpretation over the other. However, when the trade silver and gunflints are also considered, the second hypothesis seems most tenable. At both sites, the Dutch

spall-type gunflints are the only identifiable forms present. At the later Ada, Matthews and Kipp sites British prismatic, blade gunflints are the most common. At both Old Birch Island and Crabapple Point, trade silver is present but rare, again a contrast to the later sites of the Historic Period. Therefore, it seems reasonable to suggest that the sites date no earlier than 1760, the time when trade silver entered the Great Lakes region (Quimby, 1966: 91). The terminal date is more difficult to establish. It is known that Dutch gunflints were no longer popular after 1770. If the sites dated much later than this, we would expect to find a much higher occurrence of trade silver and the presence of British gunflints. In addition, one would expect to find more Late Historic bead types and fewer Middle Historic types than are represented at these sites.

The period 1760-1780 can be tentatively offered as the time of occupation at Crabapple Point although this conclusion may be premature given the rather limited area of the site excavated. Nonetheless, on the basis of the evidence which is available, a late 18th century date does seem justified.

TABLE 6

TRADE BEAD FREQUENCY TABLE
Je 93

CLASS	# OF SPECIMENS	PERCENTAGE
I	93	23.8
Ia1	39	10.0
Ia2	39	10.0
Ia3	13	3.3
Ib1	1	.3
Iaa1	1	.3
II	11	2.8
IIa1	8	2.0
IIa2	1	.3
IIa3	1	.3
IIa4	1	.3
III	169	43.2
IIIa1	87	22.2
IIIa2	79	20.2
IIIb1	3	.8
IV	83	21.2
IVa1	36	9.2
IVa2	37	9.5
IVa3	2	.5
IVa4	1	.3
IVa5	1	.3
IVb1	3	.8
IVbb1	1	.3
IVbb2	2	.5
WI	34	8.7
WIa1	18	4.6
WIa2	4	1.0
WIa3	4	1.0
WIa4	2	.5
WIa5	6	1.5
WII	1	.3
WIIa1	1	.3

TOTAL SAMPLE SIZE: 391

TABLE 7

TRADE BEAD PROVENIENCE - FEATURES

FEA. #	I a1	I a2	I a3	I b1	I aa1	II a1	II a2	II a3	II a4	III a1	III a2	III b1	IV a1	IV a2	IV a3	IV a4	IV a5	IV b1	IV bb1	IV bb2	WI a1	WI a2	WI a3	WI a4	WI a5	WII a1	TOTAL
1			1																								1
1-A		1								3															1		5
10	16	17	7			1	1			15	7			5							3		2	1	2		77
11			1																								1
12E						1																					1
12W	1	1																					1				3
13	6	3	1			3				1				1													15
TOTAL:	23	22	10			5	1			19	7			6							3		3	1	3		103

TABLE 8

TRADE BEAD PROVENIENCE - POST HOLES

POST #	I a1	I a2	I a3	I b1	I aa1	II a1	II a2	II a3	II a4	III a1	III a2	III b1	IV a1	IV a2	IV a3	IV a4	IV a5	IV b1	IV bb1	IV bb2	WI a1	WI a2	WI a3	WI a4	WI a5	WII a1	TOTALS
2														1													1
4														1													1
5											1			1													2
6										1																	1
9										2																	2
11										1	1				1										1		4
12	1	2									1																4
13	1	1											3														5
15		2																									2
16	2																										2
21	2					1				2				1													6
25		1																									1
28	1	1								1																	3
30			1																								1
31		1	1							1											1						4
33		1																									1
34																								1			1
35		1									1																2
37		1									1														1		3
41		2																									2
42	2	1								1	2												1				7
43	2	1									2			1											1		7
44		1				1				2																	4
F3	3	1	1							1	2		1				1				1	1				1	13
F9										1	1																2
TOTALS:	14	17	3			2				13	12		4	5	1		1				2	1	1	1	3	1	81

TABLE 9

TRADE BEAD PROVENIENCE - SQUARES

Sq #	I a1	I a2	I a3	I b1	I aa1	II a1	II a2	II a3	II a4	III a1	III a2	III b1	IV a1	IV a2	IV a3	IV a4	IV a5	IV b1	IV bb1	IV bb2	WI a1	WI a2	WI a3	WI a4	WI a5	WII a1	TOTAL
S10E60 - I											1		1														2
S10E80 - I	2			1	1	1				29	27		18	15		1		1			8						104
S20E80 - I										11	8		6	4					1		2	2					34
S20E80 - II										1	3										1						5
S30E80 - I										3	1			2						1	2						9
S30E80 - IIA														1													1
S40E80 - I											1																1
S40E90 - I											1			1													2
S40E90 - II										2	2																4
S40E100 - I										1	1			1													3
S50E80 - I										2	1							1									4
S50E80 - II										2	8	3	5	1				1				1					21
S50E80 - III											1																1
S50E90 - II													1														1
S50E100 - II										2			1	1													4
N50E90 - I								1	1	2	1				1					1							7
N230E20 - I											4																4
TOTAL	2			1	1	1		1	1	55	60	3	32	26	1	1		3	1	2	13	3					207

TABLE 10

TRADE BEADS - COMPARATIVE DATA

Taxonomic Designation	Je 93	Bell	Lasanen	Guebert	Michili-mackinac	Old Birch Island	Crawford Farm	Ada	Matthews	Kipp's Post
Ia1-2* (includes those listed as black)	18.4%	--	-.1%	--	--	37.2%	--	1 e.g.	--	--
Ia3	3.2%	--	--	--	--	1.7%	X	--	--	--
Ib1	.3%	--	--	--	-.1%	--	--	--	--	--
IIa1* (includes those listed as black)	1.1%	--	42.1%	--	--	-.1%	--	--	--	-.1%
IIa2-3	.5%	--	25.0%	.2%	1.9%	3.7%	X	freq.	few	--
IIa4	.3%	--	--	-.1%	--	--	--	--	--	87.7%
IIIa1-2	44.0%	--	--	.5%	2.1%	1.3%	X	1 e.g.		-.1%
IVa1-5	20.5%	--	5.3%	37.0%	49.5%	49.2%	X	freq.	few	8.1%
IVb1, bb1, bb2	1.6%	--	3.6%	1.1%	3.5%	--	--	--	--	--
WIa1	4.8%	--	--	9.8%	.4%	-.1%	X	236	3 e.g.	2.0%
WIa3	1.1%	--	--	.1%	-.1%	--	--	3	--	--
WIa5	1.3%	--	--	--	.7%	--	X	--	--	--
WIIa1	.3%	--	--	--	-.1%	--	--	--	--	--
Percentage of Total-comparable	97.7	0	76.1	54.2	59.9	93.3	--	--	less than 5%	98.0
Sample size	375	112	7213	2480	6800	12,569	Unknown	ca. 250	350	6700