the LASANEN SITE

AN HISTORIC BURIAL LOCALITY IN MACKINAC COUNTY, MICHIGAN

edited by Charles E. Cleland

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PUBLICATIONS
OF THE MUSEUM
Michigan State University
East Lansing, Michigan
1971

Vol. 1, No. 1

CHAPTER 9

Rosary and Glass Beads

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WITH the exception of shell wampum beads, rosary and glass beads generally comprise the largest numerical sample of artifacts taken from any historic site; the Lasanen Site is no exception. Although beads have been extensively described in the literature, to date, only a few attempts have been made to formally classify this artifact category; this report represents a further attempt at formal classification.

TYPE DESCRIPTIONS

Rosary Beads

Ivory and bone rosary beads were found in eight of the Lasanen burial pits: R, T, E, C, A, D, T' and P (Table 15). Rosary beads are known to occur in three basic shapes; all are represented by Lasanen Site specimens. The most common form is circular to ovate-circular and is characterized by a wide size range: 5.8 mm to 9.8 mm in diameter; 5.5 to 8.2 mm in length; with perforations of 2.2 mm to 2.7 mm. The shape of the rosary bead end is not a result of the manufacturing process but is a result of the degree of wear which would vary with the bead's position on the rosary and the amount of use. Burial pit R, for example, produced 50 circular beads which were rounded on both ends and eight which were flat or slightly concave on one end and round on the other end.

TABLE 15. FREQUENCY OF ROSARY BEAD FORMS BY BURIAL PIT

	A	C	D	E	P	R	T	T'	TOTAL
Single jointed	...	...	...	2	...	1	2	...	5
Double jointed	...	...	...	...	...	1	1	1	3
Circular	1	1	1	18	1	58	66	4	150
TOTAL	1	1	1	20	1	60	69	5	158

Circular

The circular to ovate-circular rosary beads include three size varieties: large—7.8 to 8.2 mm in length, 9.3 to 10.0 mm in diameter, 2.3 mm perforations; medium—7.1 to 7.4 mm in length, 7.9 to 8.3 mm in diameter, 2.3 to 2.6 mm perforations; and small—4.7 mm to 6.4 mm in length, 5.6 mm to 7.5 mm in diameter, 1.6 mm to 2.7 mm perforations. Table 16 lists the size-category frequency of the round rosary beads by burial-pit association. Burial pits P (1 specimen) and T' (2 out of a total of 4 specimens) contained a shape variety of rosary bead which was not found in any of the other burial pits. This variety is ovate shaped and is clearly distinguishable from any other of the circular to ovate-circular rosary beads. The size range of this variety is: 7.5 mm to 8.1 mm in length; 6.7 mm to 6.9 mm in diameter; with tapered perforations which range from 2.3 mm to 2.7 mm. Likewise, most rosary-bead specimens exhibit an irregularly tapered perforation.

TABLE 16. SIZE FREQUENCY OF CIRCULAR ROSARY BEADS BY BURIAL PITS

	A	C	D	E	P	R	T	T'	TOTAL
Small	1	1	1	17	...	54	61	2	137
Medium	...	...	...	...	...	3	5	...	8
Large	...	...	...	1	1 (ovate)	1	...	2 (ovate)	5
TOTAL	1	1	1	18	1	58	66	4	150

Double Jointed

The second basic shape of rosary beads is the double jointed. This form may be the cross-piece of the crucifix which is defined by the arrangement of rosary beads.

Of the three specimens recovered, each had a slightly different shape. All three specimens have flared ends and a flared center. The two perforations (1.9 mm to 2.3 mm) on each specimen run both parallel and vertical to the longitudinal axis of the bead and intersect at the center of the bead. Table 17 gives the metric attributes of each specimen recovered from burial pits T, R, and T'.

TABLE 17. SIZE OF DOUBLE-JOINTED ROSARY BEADS

Burial Pit (3 specimens)	Length (mm)	Diameter (at center and ends) (mm)	Minimum Diameter (mm)	Perforation (mm)
R	14.2	5.0	3.1	1.9
T	12.1	5.0	3.5	1.9
T′	16.2	5.0	3.2	2.3

Single Jointed

The third basic shape of rosary bead is referred to as single jointed and also forms a part of the rosary crucifix (Table 18). This form variety ranges from 4.8 mm to 6.8 mm in length; 3.0 mm to 5.0 mm in diameter; and has perforations of from 1.9 mm to 2.2 mm. Bead-end diameters on individual specimens are not always the same. This condition was also observed on double-jointed beads. All five single-jointed specimens varied slightly in shape but maintained a flared-end and concave-center shape. Single-jointed, bead-end shape is quite variable and ranged from slightly concave to flat (parallel to the longitudinal axis) to circular.

TABLE 18. SIZE OF SINGLE-JOINTED ROSARY BEADS

Burial Pit	Length (mm)	Maximum Diameter (mm)	Minimum Diameter (mm)	Perforation (mm)
E (2 specimens)	6.2	5.0	3.8	1.9
	6.8	5.0	3.1	1.9
R (1 specimen)	6.8	4.7	3.0	2.2
T (2 specimens)	5.5	5.0	4.0	2.2
	4.8	4.8	3.8	2.2

DISCUSSION

Rosary beads range in color from light pink and light brown to dark brown. Surface texture and appearance varies from smooth and highly polished to rough and eroded. The extent of surface erosion apparently varies both with material and circumstances of use and subsequent deposition.

All rosary beads found at the Lasanen Site were apparently with bead ends consisting of circular grooves or ridges encircling the end. Furthermore, the consistency in shape of the beads attests to their production by machine tools.

The normal complement of rosary beads on a rosary is thought to approximate the following: 53 small circular beads; 6 medium circular beads; one large circular bead; two single-jointed beads; and one double-jointed bead. The jointed beads and the one large circular bead form the crucifix; the remaining beads, which are strung in a series of 10 small beads separated by one medium one, form the actual rosary chain. Between the chain and crucifix, there is probably a catlinite or bone linkage, two medium circular beads, and three small circular beads. All beads are thought to have been joined by a series of metal chain links, although the excavations produced no evidence of this. The beads from burial pit R most closely approximate this expected complement (54 small, 3 medium, 1 large, 1 double-jointed, and 1 single-jointed). Burial pit T produced 61 small, 5 medium, 0 large, 2 single-jointed and 1 double-jointed bead. Burial pit E produced 17 small, 1 large, and 2 single-jointed beads. We can, therefore, say with some degree of certainty that burials E, T, and R each contained a nearly complete rosary. Fragmentary rosaries were found in the remaining burials. It is significant to note the association of metallic religious medallions in burial pits T and R.

In comparison with rosary beads from Fort Michilimackinac, the Lasanen Site specimens appear to be less elaborate in form and design, although the three basic form categories are the same. The Fort Michilimackinac specimens are often elaborately carved and exhibit a greater size and shape range.

TYPE DESCRIPTIONS

Glass Beads

The Lasanen Site burial pits produced a total of 7213 European manufactured, glass trade beads. This assemblage is classified and described in this chapter. Bead frequencies by type as well as variety per pit are listed in Appendix A.

Recent trends in the description and interpretation of artifacts from historic sites have shown an increasing sophistication and concern with technical detail. Discussions of typological criteria and problems of comparison with other sites aimed at firm chronological and spatial control are well represented in a number of recent historic site reports; these include Duffield and Jelks (1961), Webb and Gregory (1965), and Harris *et al.* (1965). With this background, the following detailed analysis and formal description of the Lasanen Site bead assemblage have been prepared.

Preliminary field observations suggested certain interpretations of bead distribution and associations which could only be tested by the results of a formal analysis. It was apparent that different types of beads were numerous in some burial pits and scarce or absent in others; thus the possibility of either functional—differences in sex, age, or status

of the associated burials—temporal, or even cultural differences between the various burial pits was suggested. Furthermore, several of the bead types which appear here, have, to our knowledge, never been fully described in print. The bead assemblage from the Lasanen Site is thought to represent an early temporal segment of the Middle Historic period in the Upper Great Lakes area about which little is known. Thus, we view this bead assemblage as a temporal and typological "gap filler"; in addition it comprises a large body of comparative material.

The approach utilized in the analysis of the Lasanen Site bead assemblage was similar to that employed by Duffield and Jelks (1961) in their analysis of the Pearson Site beads. The first step in the analysis was to subdivide the bead assemblage into classes based on structure or form. The classes in our sample are: A—simple, B—compound, and C—complex. Simple beads are composed of only one structural component, as in Class A, Types 1 through 9. Compound beads are composed of two structural components which usually consist of a simple glass core and either a glass surface veneer or glass rod insets. Compound beads are represented by Class B, Types 1 through 6. Complex beads consist of three or more components, as in Class C, Types 1 through 3. The further subdivision of bead classes into types was based on the criteria of size, shape, or color. It was considered impractical for the classification of the Lasanen Site bead assemblage to adhere to a rigid set of type-criteria in defining bead categories. Some types were defined on the basis of size differences, whereas others were defined on the basis of size and shape correlations or color differences. Although the subjectivity of this approach may be argued, it is apparent that the least amount of taxonomic distortion is imposed on the sample if categories are defined in this manner and not by strict adherence to a type-criteria categorization. To minimize the possibility of any taxonomic ambiguity, we have, therefore, listed in all cases the criteria which were significant in defining bead types. Type varieties were defined similarly.

A number of types were easily recognized by simple inspection; certain others required the use of more refined techniques such as microscopic analysis and bead sample measuring. In some cases, when the sample was sufficiently large and there were questions relative to construction detail, beads were fractured to provide a cross sectional view. In other cases, it was necessary to determine the refractional characteristics of suspected types or type varieties. Color determinations were made by simple inspection and in many cases described by analogy. The definition of surface characteristics (that is, air-bubble pits, striations, wear, and so on), and construction detail was simplified by the use of a binocular microscope. Perforation diameters were taken with steel drill bits graduated in 64ths of an inch; these measurements were later converted to millimeters.

We have attempted to exercise consistency in the description of bead shape. The following three-dimensional sketches and accompanying terminologies define the basic shape categories used in this report (Fig. 40). Variations and combinations of these shape categories do exist and will be mentioned in the context of individual bead descriptions.

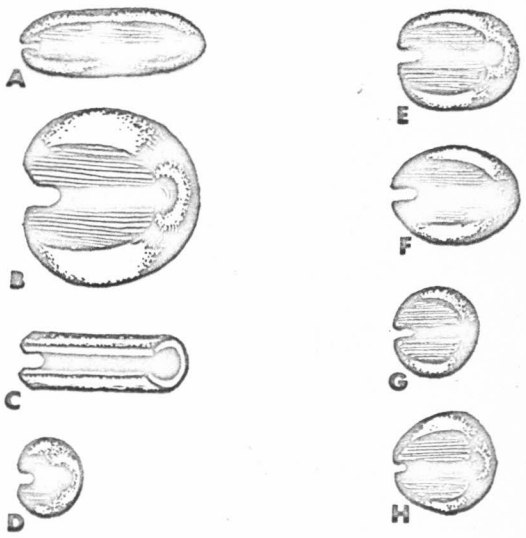

Fig. 40. Bead-shape categories in three-dimensional perspective.

A. Elongate	E. Barrel
B. Globular	F. Convex
C. Tubular	G. Round
D. Doughnut	H. Conical

Class A: Simple Structure

Type 1
Fig. 41 A-1

The designation of beads as Type 1 was made primarily on the basis of size. The beads represented by this type are generally referred to as "seed beads." The measurements are: length, 1.6 to 3.0 mm; diameter, 2.4 to 4.6 mm, and perforations, 1.0 to 1.5 mm. Type 1, seed-bead varieties were defined on the basis of color differences.

Variety a (Fig. 41 A-1-1)—light blue, opaque, spheroidal (doughnut-shaped) "seed bead"; 176 specimens: pit A (1); pit R (4); pit T (165); pit T′ (5); and pit U (1). The light blue color and opaque nature of this variety produce a cloudy or milky blue appearance. The basic doughnut shape varies in slight proportion to length and diameter differences. The surface of this variety is somewhat coarse with numerous, small air-bubble pits which occasionally

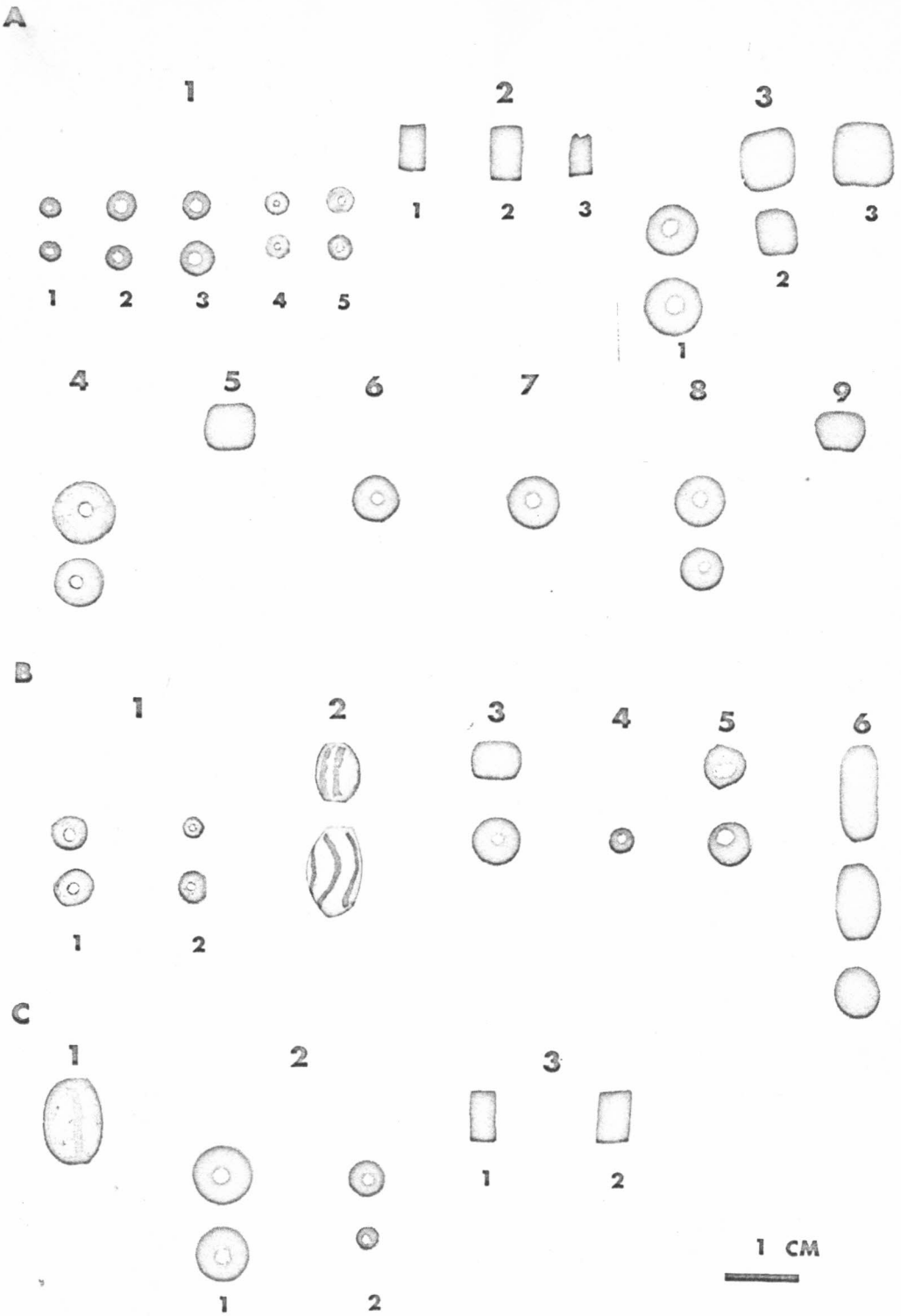

Fig. 41. Beads from the Lasanen Site

Simple Structure

A-1. Type 1
A-1-1. Type 1, Variety *a*
A-1-2. Type 1, Variety *b*
A-1-3. Type 1, Variety *c*
A-1-4. Type 1, Variety *d*
A-1-5. Type 1, Variety *e*

A-2. Type 2
A-2-1. Type 2, Variety *a*
A-2-2. Type 2, Variety *b*
A-2-3. Type 2, Variety *c*

A-3. Type 3
A-3-1. Type 3, Variety *a*
A-3-2. Type 3, Variety *b*
A-3-3. Type 3, Variety *c*

A-4. Type 4
A-5. Type 5
A-6. Type 6
A-7. Type 7
A-8. Type 8
A-9. Type 9

Compound Structure

B-1. Type 1
B-1-1. Type 1, Variety *a*
B-1-2. Type 1, Variety *b*

B-2. Type 2
B-3. Type 3
B-4. Type 4
B-5. Type 5
B-6. Type 6

Complex Structure

C-1. Type 1
C-2. Type 2
C-2-1. Type 2, Variety *a*
C-2-2. Type 2, Variety *b*

C-3. Type 3
C-3-1. Type 3, Variety *a*
C-3-2. Type 3, Variety *b*

occur in longitudinal series imparting a striated effect to the bead surface. Circular air-bubble-pit-formed grooves occur on the bead ends but are not always obvious by simple inspection. Two non-exclusive size groupings of this variety have been defined: (1) tiny—length, 1.8-2.2 mm; diameter, 3.0-3.3 mm; perforations, 1.0 mm; and (2) small—length, 2.5-3.1 mm; diameter 3.8-4.6 mm; and perforations, 1.0-1.4 mm.

Variety b (Fig. 41 A-1-2)—blue, translucent, spheroidal (doughnut-shaped) "seed bead"; 1804 specimens: pit A (236); pit B (12); pit C (24); pit D (89); pit E (2); pit K (72); pit M (8); pit R (1359); pit U (2). Representative colors from this sample vary from blue to blue-purple to blue-green. There is a general size range in this sample from tiny to small with no noticeable, distinct size gap. Shape varies from flattened and doughnut-like to almost round. Size and shape correlations were not apparent from this sample. Surface patination was apparent on at least 10 per cent of the sample. Air-bubble pits are generally frequent and occasionally occur in longitudinal series. Circular grooves on the bead ends are also apparent. This variety ranges in size from 3.1-4.6 mm in diameter, from 1.0-3.2 mm in length, and has perforations of from 1.0-1.4 mm.

Variety c (Fig. 41 A-1-3)—black, opaque, spheroidal (doughnut-shaped) "seed bead"; 3037 specimens: pit A (1291); pit B (124); pit D (34); pit E (28); pit K (33); pit R (1102); pit T (390); pit T′ (3); pit U (32). Type 1, Variety *c* represents the numerically largest category of beads from the Lasanen Site. Variety *c* beads have a considerable shape range, from flattened and doughnut-like to almost round. The basic doughnut shape was often irregular (that is, the appearance of having been distorted by diagonal compression is given). Surface, air-bubble pits are infrequent, whereas circular bead end and longitudinal striations occur on perhaps 20 per cent of the sample. This striated effect is thought to result from layering irregularities produced during the manufacturing process. Bead-surface appearance varies from dull to shiny and is a function of post-manufacture wear. Patination is very infrequent. Two size clusters were noted in this variety sample: (1) tiny—length, 1.6-2.1 mm; diameter, 2.4-3.0 mm; perforations, .8-1.0 mm; and (2) small—length, 2.0-3.3 mm; diameter, 3.5-4.6 mm; and perforations, 1.0-1.4 mm.

Variety d (Fig. 41 A-1-4)—white, opaque, spheroidal (doughnut-shaped) "seed bead"; 78 specimens: pit R (58) and pit T (20). This variety is very consistent in size and shape. Air-bubble pits are common but occur in longitudinal series infrequently. None of the Variety *d* specimens are patinated. Length, 2.0-2.1 mm; diameter, 3.1-3.3 mm; perforations, 1.0-1.5 mm.

Variety e (Fig. 41 A-1-5)—clear-glass, translucent, spheroidal (doughnut-shaped) "seed bead"; 143 specimens: pit B (1) and pit R (142). This variety most closely approximates Variety *b* in surface features and form. Patination is rare. Circular end and longitudinal striations are present but faint and do not occur in all specimens. Unusually large air-bubble pits are common. Length, 2.0-2.3 mm; diameter, 3.1-3.5 mm; perforations, 1.0-1.2 mm.

Type 2
Fig. 41 A-2

The criterion of shape was of major use in the definition of Type 2 beads; all three varieties are cylindrical (tubular) in shape. Type 2 varieties were defined on the basis of color and size differences. Secondary variety attributes will be mentioned in the context of each variety description below. This type varies in length from 4.8-7.9 mm, in diameter from 3.2-4.8 mm, and has perforations of from 1.4-2.0 mm.

Variety a (Fig. 41 A-2-1)—blue, translucent, cylindrical (tubular); 1 specimen: pit A. This specimen exhibits very prominent longitudinal and circular-end striations. Air-bubble pits are small and generally mark the entire bead surface. Length, 6.8 mm; diameter, 4.8 mm; perforations, 1.8 mm.

Variety b (Fig. 41 A-2-2)—black, opaque, cylindrical (tubular); 2 specimens: pits K and R. This variety is very similar to Class C (complex), Type 3 beads, which are distinguished by the presence of longitudinal glass insets. Air-bubble pitting is minimal. Faint circular end and longitudinal striations are present on both specimens. This variety exhibits a very low luster. Specimen 1 (pit K): length, 7.9 mm; diameter, 4.5 mm; perforation, 1.4 mm; specimen 2 (pit R): length, 6.0 mm; diameter, 4.2 mm; and perforation, 1.4 mm.

Variety c (Fig. 41 A-2-3)—black, opaque, cylindrical (tubular); 2 specimens: pits A and T. This variety exhibits a very coarse, air-bubble-pitted surface. A number of these pits occur in short, angular series. No circular ends of longitudinal striations were apparent although one, deep, longitudinal groove was noted on the pit T specimen. The definition of this variety as distinct from Variety *b* above was made on the basis of the large perforation size in proportion to diameter. Length, 6.0 mm; diameter, 3.2 mm; perforation, 2.0 mm.

Type 3
Fig. 41 A-3

The sample of beads described here as Type 3, Varieties *a, b,* and *c,* was perhaps the most difficult to classify in terms of any consistent type or variety determinants. All beads of this type are black and opaque and are medium to large in size. Variations in shape are thought to result from differences in the final "drawing-out" or tumbling stages of manufacture. Thus, we note a sharp range from cylindrical (barrel) to spheroidal (round to globular).

Variety a (Fig. 41 A-3-1)—black, opaque, spheroidal (round to globular); 1215 specimens: pit A (19); pit B (2); pit C (10); pit E (23); pit F (3); pit K (9); pit R (127); pit FF (5); pit T (445); pit T′ (531); pit U (41). Variety *a* beads are characterized by a large size and shape range, although no correlations between size and shape were noted. Variations in this variety are thought to represent slight modifications of the same basic manufacturing process. Patination occurs on approximately 10 per cent of the specimens. Large, surface air-bubble pits and longitudinal and circular end striations are common. Eight double specimens were noted; these had not been completely separated during manufacture. Length, 4.2-8.2 mm; diameter, 4.6-10.6 mm; and perforations, 1.2-2.8 mm.

Variety b (Fig. 41 A-3-2)—black, opaque, cylindrical (barrel-shaped); 66 specimens: pit A (20); pit C (4); pit E (2); pit R (5); pit T (13); pit T′ (20); pit U (2). The criteria of shape and bead-end treatment distinguish this variety. The fact that Variety *b* beads occur only in association with Variety *a* beads, however, may indicate that these two varieties should be lumped as a single type. Further study of this sample may be necessary before this problem is resolved. The shape of this variety is consistently barrel-like. Circular end grooves (other than those produced by a series of air-bubble pits) are noted on the majority of Variety *b* specimens. Large differences in surface luster (from very dull to shiny) are noted but do not seem to vary in frequency with either size or shape. Bead-end treatment is irregular and varies from flat (parallel to the bead body) to diagonal. Most specimens exhibit longitudinal striations, although these are often difficult to define on specimens with a very high luster. Air-bubble pitting is minimal. Length, 5.5-10.0 mm; diameter, 6.0-9.0 mm; perforations, 1.6-2.0 mm.

Variety c (Fig. 41 A-3-3)—black, opaque, cylindrical (barrel-shaped); 1 specimen: pit E. This specimen has a very glossy appearance with very few air-bubble pits. Perforation size and end treatment define this specimen as a Type 3 variety. Bead-end treatment is very irregular; a diagonally warped appearance is given. Length, 8.5 mm; diameter, 9.0 mm; perforation, 3.2 mm.

Type 4
Fig. 41 A-4

White, opaque, spheroidal (round to sub-globular); 47 specimens: pit R (45) and pit T′ (2). Shape varieties of this type are difficult to describe. There is an uninterrupted range in shape from cylindrical (sub-barrel) to spheroidal (round). Patination is only apparent on fractured surfaces, due perhaps to the unaltered nature of the internal glass as opposed to the altered (by tumbling or wear) external surface. Air-bubble-formed, longitudinal striations occur on most specimens. Circular end striations are present but infrequent. Two size clusters of this type have been defined: (1) medium—length, 4.8-6.5 mm; diameter, 6.3-7.0 mm; and perforations, 1.6-2.0 mm; and (2) large—length, 7.9-8.1 mm; diameter, 8.1-8.3 mm; and perforations, 1.8-2.0 mm.

Type 5
Fig. 41 A-5

Dark blue, translucent, cylindrical (barrel-shaped); 2 specimens: pit T. Patination and air-bubble pitting (occasionally series of pits form longitudinal grooves) are very prominent on these two specimens. Circular end and longitudinal striations are easily seen. Bead ends are encircled by an air-bubble-pit groove. Length, 7.0-7.5 mm; diameter, 7.6-8.0 mm; and perforations, 2.0 mm.

Type 6
Fig. 41 A-6

Blue-green, slightly translucent, spheroidal (doughnut-shaped); 1 specimen: pit R. The surface of this specimen is very coarse and gritty in appearance. The glass core is translucent; however, the nature of the surface gives this bead an opaque quality. Longitudinal, air-bubble-pit grooves cover the entire surface of this specimen. Considerable evidence of wear is noted on all surfaces. Length, 4.5 mm; diameter, 6.3 mm; and perforations, 1.6 mm.

Type 7
Fig. 41 A-7

Light blue, opaque, spheroidal (round); 1 specimen: pit T. This specimen is similar in color to Type 1, Variety *a*, and has a milky or cloudy blue appearance. Longitudinal striations are common, many of which are formed by rows of air-bubble pits. Bead ends show considerable wear. Length, 6.3 mm; diameter, 7.3 mm; and perforations, 1.4 mm.

Type 8
Fig. 41 A-8

Red opaque, cylindrical to spheroidal in shape; 43 specimens: pit A (1); pit F (5); pit R (1); pit T (12); pit T′ (24). This type is composed of very opaque, porcelain-like, red glass. The surfaces of all specimens are dull in appearance. In longitudinal cross section, the glass core has a layered appearance—alternating layers of red and clear glass. Surface air-bubble pitting is minimal. The shape, form, and size of this type is quite variable. Bead shape ranges from cylindrical (barrel) to spheroidal (round). Bead ends are irregular and vary from perpendicular to diagonal to the bead body. A number of the smaller specimens exhibit a sharp, irregularly fractured end which exhibits little subsequent

abrasion by tumbling. Several specimens are marked with a slight, end concavity; presumably this is a function of wear by use. Length, 4.5-8.0 mm; diameter, 6.0-8.6 mm; perforations, 1.4-2.0 mm.

Type 9
Fig. 41 A-9

Amber, translucent, conical; 1 specimen: pit A. This specimen is cone-shaped with the perforation running parallel to the axis of the cone. Circular, side striations are very apparent. This is the only bead type with striations of this nature; all others have been longitudinal. The surface is badly air-bubble pitted and exhibits many irregular pits produced by the decomposition of foreign materials in the glass core. The smaller end of the cone has apparently been fractured since manufacture. The surface is moderately patinated. Length, 5.8 mm; diameter, 4.5-7.2 mm; perforations, 1.4 mm.

Class B: Compound Structure

Type 1
Fig. 41 B-1

Two varieties of this white, opaque compound bead have been distinguished on the basis of size and provenience differences.

Variety a (Fig. 41 B-1-1)—white, opaque, cylindrical (barrel-shaped); 10 specimens: pit D. Construction of this variety is compound with an inner core of milk-white glass and a surface veneer of clear glass. The basic, barrel shape of this variety is often irregular or lopsided. Air-bubble pits are more prominent in the glass core, because it is exposed at the bead ends. The milky glass core, more resistant to erosion than the clear-glass veneer, often forms a very noticeable rim or lip which encircles each end of the bead. Irregular series of air-bubble pits mark the clear-glass surface. Length, 3.5-4.8 mm; diameter, 4.5-5.3 mm; perforations, 1.2-1.4 mm.

Variety b (Fig. 41 B-1-2)—white, opaque, spheroidal (doughnut-shaped) "seed bead"; 370 specimens: pit C (2); pit R (246); pit T′ (122). This variety is also composed of an inner core of opaque, white glass and a surface veneer of clear glass. The inner core is exposed at the ends of all beads where it is noticeably more air-bubble-pitted than the surface veneer. Longitudinal, air-bubble striations are characteristic of this type. Surface patination was not present. The compound structure of this bead is often very difficult to detect on very small specimens. Length, 1.6-2.6 mm; diameter, 2.6-3.6 mm; and perforations, 1.0-1.2 mm.

Type 2
Fig. 41 B-2

White, opaque, cylindrical (convex); 20 specimens: pit A (19); pit M (1). Construction is of a white (ceramic-like), air-bubble-pitted glass with surface insets of three red and three green alternating glass rods. All specimens have a dull surface appearance. The shape, thickness, and length of the rod insets vary considerably, although there does seem to have been an attempt on most beads to swirl the rods. Due to bead-shape irregularities, the rods vary in shape from straight to semi-circular and jagged (on one specimen). One specimen was noted on which two rods were missing—the four rods present were three green and one red. Bead ends are poorly executed; often they are diagonally fractured and distorted. Two size clusters were noted: (1) medium—9 specimens: pit A (8); pit M (1); length, 7.5-11 mm; diameter, 5.4-6.3 mm; perforations, 1.6-2.0 mm; and (2) large—11 specimens, pit A; length, 11.4-13.8 mm; diameter, 6.9-7.8 mm; and perforations, 1.6-2.0 mm.

Type 3
Fig. 41 B-3

Black, opaque, cylindrical (barrel-shaped); 1 specimen: pit T′. Two elements compose this bead: a core of air-bubble-pitted black glass and a series of six longitudinal white-glass surface insets. The ends of this specimen are very flat. The white, glass insets run parallel from end-to-end and are unequally spaced about the bead surface. The insets are very thin and have been removed by wear erosion in several places. Circular, end striations are present but faint. Length, 5.5 mm; diameter, 7.1 mm; perforation, 1.8 mm.

Type 4
Fig. 41 B-4

Dark brown, opaque, spheroidal (round); 1 specimen: pit K. This bead type is very small in comparison with other colored-inset beads. The brown, glass core is highly air-bubble pitted with longitudinal striations. Six white, glass insets run parallel to the sides. The insets are denser than the glass core and thus form a series of white, glass ridges on the bead surface. The insets are variable in thickness and are badly eroded in some spots. Length, 3.3 mm; diameter, 3.8 mm; and perforation, 1.5 mm.

Type 5
Fig. 41 B-5

Black, opaque, spheroidal (circular); 1 specimen: pit D. The black, glass core of this bead is very dull and marked with small air-bubble pits. Three equally spaced, white, glass

insets (splotches) are found on the bead surface. The ends of this specimen are distorted and fractured; thus, the bead has a lopsided appearance. Length, 5.2 mm; diameter, 6.1 mm; perforation, 2.0 mm.

Type 6
Fig. 41 B-6

Dark blue, translucent, cylindrical (convexo to convexo elongate); 132 specimens: pit A (2); pit D (91); pit K (5); pit M (24); pit R (6); pit T (2); pit T′ (1); pit U (1). This type is very consistent in color and structure but varies in size and shape. The Type 6 construction is compound with an inner core of dark blue, translucent glass and a surface veneer of clear glass. This characteristic is only apparent however, on broken specimens. Type 6 beads are very brittle and are marked by numerous, small air-bubble pits. Circular end grooves have been observed on the majority of specimens. Longitudinal and circular end striations are not apparent. Length, 5.0-14.0 mm; diameter, 4.5-6.5 mm; perforations, 1.1-1.5 mm.

Class C: Complex Structure

Type 1
Fig. 41 C-1

White, opaque, cylindrical (convexo); 1 specimen: pit A. Construction is two layers of opaque white glass with two blue and two red alternating, equally spaced, glass-rod surface insets. The ends of this specimen are marked by a circular groove produced by the surface junction of the two glass layers. The glass insets terminate at this junction. The insets seem to be immediately surrounded by clear glass with a very few air-bubble pits; thus, the possibility of a fourth structural component of clear glass is indicated. The opaque, glass veneer is marked by the presence of longitudinal striations and numerous air-bubble pits. Length, 11.8 mm; diameter, 7.8 mm; and perforations, 1.8 mm.

Type 2
Fig. 41 C-2

This type consists of the well-known Cornaline d'Aleppo bead. Two varieties have been defined on the basis of minor differences in construction detail and size.

Variety a (Fig. 41 C-2-1)—red, translucent-opaque, cylindrical (barrel-shaped); 28 specimens: pit A (1); pit B (2); pit C (5); pit T (7); pit T′ (13). This bead is composed of three structural elements: an inner core of light green, translucent glass; a middle layer of porcelain-like, opaque, red glass; and a surface veneer of clear glass. The light green, air-bubble-pitted core is exposed on each end of the bead. The middle layer is dense and thin and frequently forms a circular protruding lip at the bead ends. The occurrence of this lip is thought to be a function of the final tumbling stage of manufacturing and of subsequent erosion. The surface veneer layer is composed of highly air-bubble-pitted clear glass. A circular air-bubble-pit groove has been noted immediately under the red-glass lip on most specimens. Patination is frequent on the clear, glass veneer. One specimen was noted which has been modified by the removal of three, opposing, longitudinal glass facets, thereby producing a multi-faceted Cornaline d'Aleppo bead and exposing a cross section of the three glass layers. Length, 5.2-7.3 mm; diameter, 6.1-8.3 mm; perforations, 1.4-1.8 mm.

Variety b (Fig. 41 C-2-2)—red, translucent-opaque, spheroidal (doughnut-shaped); 26 specimens: pit E (1); pit K (4); pit T′ (21). The three glass layers of this variety exhibit the same basic color and structural characteristics as did Variety *a*, although a lack of consistency in shape has been noted. Also, Variety *b* specimens do not exhibit a red glass lip exposed on the bead ends. Two distinct size clusters of this variety have been noted and are: (1) tiny—"seed beads," 4 specimens from pit K; length, 2.0-2.1 mm; diameter, 3.1-3.5 mm; perforations, 1.0 mm; and (2) small—22 specimens: pit E (1); pit T′ (21); length, 3.0-3.3 mm; diameter, 4.5-5.1 mm; and perforations, 1.2-1.5 mm.

Type 3
Fig. 41 C-3

Class C, Type 3 beads are defined on the basis of shape (tubular). Type 3 varieties are defined on the basis of color of the glass-rod insets.

Variety a (Fig. 41 C-3-1)—black, opaque, cylindrical (tubular); 1 specimen: pit K. The three-part construction of this variety is represented by a black, glass-tube core; three longitudinal, red-glass insets; and a very thin, clear-glass surface veneer. Each red-glass inset is composed of four very small, circular, glass rods. Circular end and longitudinal striations are very noticeable. Air-bubble pits mark the clear-glass veneer. Length, 7.3 mm; diameter, 3.8 mm; and perforations, 1.4 mm.

Variety b (Fig. 41 C-3-2)—black, opaque, cylindrical (tubular); 2 specimens: pits R and U. This variety differs from Variety *a* only in the color of glass insets, which are white in the Variety *b* sample. Length, 7.5-8.5 mm; diameter, 4.7-4.8 mm; and perforations, 1.4-1.6 mm.

DISCUSSION

Distributional Analysis of Glass Bead Categories

Preliminary field observations suggested the possibility that bead-type distributional differences existed among the

Lasanen Site burial pits. Although primary conclusions defining factors responsible for these differences cannot be drawn without reference to the total artifact assemblage, we are able to list several tentative observations based only on bead distribution-association.

In arriving at these tentative observations we exercised the use of simple per cent frequency distribution of bead categories by burial-pit provenience. Other associated artifacts or depositional circumstances defined during excavation were not considered. Indices of association between pits on the basis of bead categories were computed; however, the results in this case only confirmed observations originally made on the basis of bead frequency distributions and reflected differences in the number of beads and bead categories per pit.

Observations based on bead category distribution carried out under the above circumstances are as follows:

1. Pits I, P, H, O, and S were the only burial pits which contained artifactual material but no beads.
2. Fourteen of the 29 bead categories account for 99.6 per cent of the total bead sample. This reflects the fact that a number of bead categories are represented by only a few specimens. These minor types are of minimal use in the definition of bead category-burial pit associations.
3. "Seed beads" account for 78.1 per cent of the total bead sample. The seven "seed bead" categories plus Class A, Type 3 beads (black opaque, spheroidal to cylindrical) account for 95.8 per cent of the total bead sample. Since the majority of the bead sample is represented by only 10 categories which are distributed in almost all burial pits, it is difficult to reach any significant conclusions based on distribution differences between the majority of the bead categories.
4. Four burial pits (A, R, T, and T') account for 90.0 per cent of the total bead sample.
5. There is some evidence to indicate that pits A and R are similar in bead content and that pits T and T' are similar in bead content. Furthermore, pits A and R differ significantly from pits T and T' in bead content. Pits A and R contain large quantities of Class A, Type 1, Variety *b* "seed beads" but small quantities of Class A, Type 3 beads. Pits T and T', on the other hand, reflect the opposite pattern of association. "Seed beads" account for 95 per cent and 93 per cent of the bead sample in pits A and R, respectively; whereas "seed beads" account for only 20 per cent and 54 per cent of the bead sample in pits T and T', respectively. On the basis of bead distribution alone, then, I suggest that pits A and R were produced under different functional, depositional, and/or temporal conditions than pits T and T'.

Other than the above suggestions, the distribution of the Lasanen Site bead assemblage appears to be random—at least on the basis of per cent frequency distributions by burial pits, and in view of the fact that an attempt was not made to draw correlations between bead categories and the remaining artifact assemblages.

This apparent random bead distribution may be due to the random nature of the burial pits. For example, if the major burial pits (those containing the greatest quantities of artifacts and human skeletal remains) are secondary multiple interments, as the evidence from these pits would seem to indicate, then it is logical to expect that a random mixing of artifacts (including beads) from the primary burial components was effected at the time of re-interment. Furthermore, the same circumstances would tend to influence the distributional clusterings resulting from functional (sex, age, status, and so on) difference. In other words, multiple re-interment would tend to equalize any differences which existed in the primary burials. Unfortunately, our small sample of individual burials does not provide sufficient evidence on the basis of which to project and interpret associations in the case of multiple interments.

Summary of Bead Types

References to historic site reports containing descriptions of glass beads and to well-known histories of technology indicate that our knowledge of bead manufacturing processes and distribution patterns is inadequate. A detailed knowledge of these and other factors would facilitate a more consistent and significant classification; that is, a classification in terms of the factors which affected the physical characteristics and distribution patterns of beads. For example, factors such as cost of manufacture, the origin and significance of structural detail, and the non-European (Indian) value of different bead types might prove instrumental in the realization of a classification system characterized by a consistent use of culturally meaningful criteria. Although the discussion to follow does not attempt in any large way to remedy this situation, we are interested in pointing out certain observed technological characteristics which may prove at a later date to be useful in a definitive and culturally significant bead classification.

To my knowledge, there are only two published sources which contain descriptions of the various manufacturing stages and equipment necessary to mass produce beads for a non-European market. (JCB 1856; and *Knight's Mechanical Dictionary:* Vol. 1, 253-254). The reader is referred to Arthur Woodward's (1965) summary of these two sources. Briefly, the process of simple (Class A) bead manufacture entails the following:

1. The glass is produced by heating the various elements in large furnaces. Coloring pigments are added at this time if required.

2. Small portions of the molten glass are removed from the furnace on metal rods, cooled by water, and then reheated.
3. Small portions are once again removed from the furnace on metal rods; two "lumps" are joined while hot and drawn apart or stretched by two workmen walking in opposite directions.
4. The drawn-out tube is then left to cool.
5. After cooling, the rod is broken into 3-foot segments which are later further divided into the approximate desired bead lengths.
6. The beads are next tumbled in an iron drum containing sand and ash which function as an abrasive. A second tumbling process later polishes the beads.
7. The final step is the sorting of the bead lot into various size categories.

Although this is only a brief and incomplete summary of the bead manufacturing process, some of the points mentioned will be helpful in understanding a number of distinctions which were made in the descriptive section and which have served to guide the following bead-class summary.

In following Duffield and Jelks (1961) example and according to the above typology, bead descriptions are summarized in terms of the three major structural classes.

Class A (Simple Structure): Simple bead construction is represented in this report by Class A, Types 1 through 9. This series of types and type-varieties varies considerably in color, shape, and size. The majority of types within this class (and all other classes) exhibit surface air-bubble pits (often found in longitudinal or irregular series) and longitudinal and circular end striations. As viewed in cross section, these parallel striations are found throughout the glass core and conform to the basic bead shape, thus indicating that the striations were produced during bead segmentation (Step 5 above) while the glass tube was in a plastic state. The final desired bead length and shape was then only approximated during segmentation; subsequent tumbling produced the desired bead form within the size limits of the glass segment. The occurrence of air-bubble pits is thought to be a function of variations in the refinement of one or several manufacturing stages.

Documentary evidence indicates that different bead sizes served different functions (*see* Swanton 1911:56). Small (seed beads) and medium-sized beads are thought to have been attached to cloth and skin garments. Larger beads were strung and used as necklaces. A further division of the "seed bead" category was apparently common as Woodward points out (1965:11-12). Two size varieties of "seed beads" were known: (1) tiny, and (2) small or "pound beads." This observation has been substantiated by several samples from the Lasanen Site, such as, Class A, Type 1, Variations *a* and *c*, and Class C, Type 2, Variety *b*.

Class B (Compound Structure): Compound bead construction is represented by Class B, Types 1 through 6. The manufacture of Class B beads is an elaboration of the steps used in the manufacture of simple beads. The component addition is made between Steps 2 and 3 above, at which time the metal rod is immersed in two different glass compounds thereby producing two layers of glass. Class B beads are characterized by the presence of a glass core of one type of glass and a surface veneer of another type. The core glass apparently remains plastic while the surface veneer is formed; this is suggested by the striation conformity of the two layers in longitudinal cross section. The compound glass tube is then segmented while still in a plastic state. The presence of a veneer end overlap may be a result of this practice. A second style of compound beads entails the modification of the glass core with surface insets of colored glass. Insets are normally composed of four, very small, circular glass rods.

Class C (Complex Structure): Complex bead construction is represented by Class C, Types 1 through 3. A further elaboration of the compound construction technique above was necessary to produce complex beads. In Type 2 (Cornaline d'Aleppo) two glass layers were added to the simple glass core. All three components differ in color and density. Longitudinal cross sections of this type indicate that the center core remained plastic while the middle and surface layers were formed. The beads were then segmented while plastic. Other styles (Types 1 and 3) were composed of a glass core, insets and a veneer, or, a glass core and a veneer containing glass-rod insets.

The classes, types, and varieties of beads as defined and described above reflect a number of major technological variations. These variations, as reflected in the final bead form, account for the three class categories of the Lasanen Site bead assemblage. Other equally tenable criteria might have been employed to classify this particular assemblage. A definition of classes on the basis of shape or color, for example, might have had greater significance in terms of non-European (Indian) value systems. Unfortunately, documentary evidence offers little of this type of information. The classification above was based on the premise that compound and complex beads would be proportionately more expensive to produce and would demand, in exchange, Indian commodities of higher European value. The quantity of beads in each class (Class A—6620; Class B—535; Class C—58) lends support to this reasoning. In another light, the value of different types of beads may have varied with the time and area of contact.

Comparison and Chronology

Two lines of evidence were useful in the chronological assessment of the Lasanen Site bead assemblage. Comparative

evidence from published historic site bead descriptions permitted the placement of the Lasanen Site bead assemblage in a roughly defined time period. Negative evidence (that is, the absence of certain bead types at the Lasanen Site which have been accurately dated at other sites) was useful in further delineating the correct time span.

Any attempt to date a bead assemblage on comparative and typological grounds should acknowledge the following potential sources of error: (1) certain bead types are virtually useless as temporal indicators (except in very general terms), since they occur on many sites which are widely separated in time and space; (2) one or several bead-type associations from two sites does not necessarily define contemporaneous (or even near contemporaneous) site occupations; and (3) sites from widely separated areas may have experienced the introduction of the same bead type at different points in time.

The Bell Site, a Fox Indian village in Winnebago County, Wisconsin, produced trade materials estimated by Wittry (1963) to date between 1680 and 1730. The most frequent bead types at the Bell Site, large oval to round spun translucent milky glass, opaque white ovoids and multi-faceted beads, are not found at the Lasanen Site. These types, however, are found in early French occupations at Fort Michilimackinac, Emmet County, Michigan. This military post and fur-trade center was occupied by the French from approximately 1715 until 1761 and by the British from 1761 to 1781. This evidence suggests three alternate interpretations: (1) The Lasanen Site assemblage dates prior to 1680; (2) Wittry's initial date for the Bell Site is too early; or (3) the Lasanen and Bell Site occupations are in part contemporaneous; however, due to functional and/or distributional differences in the bead assemblages from the two sites, there is no evidence of contemporaneous occupation on bead typological evidence alone. On the basis of present evidence, both the second and third alternatives may have been instrumental in producing the observed discrepancies in dated bead type associations from the Bell and Lasanen Sites. The bead assemblage from Fort Michilimackinac, on the other hand, indicates little typological overlap with the Lasanen Site and a typologically significant overlap with the Bell Site. The Lasanen Site bead assemblage would thus date prior to 1715 on typological grounds (but not necessarily prior to 1680 as suggested by the Bell Site date, since the Bell Site assemblage closely approximates the earliest dated beads from Fort Michilimackinac).

Additional support to this general conclusion is suggested by reference to materials from the Gros Cap Cemetery Site at St. Ignace, Michigan, which Quimby (1963:50-57) dates from 1710 to 1760. The date suggested by Quimby is supported by dated bead types from Fort Michilimackinac. Large, spun, milky white and multi-faceted beads which date from early French contexts at Fort Michilimackinac are found to predominate at the Gros Cap Site. Neither of these two major types occur at the Lasanen Site.

Quimby (1966:81-90, 183-190) presents bead assemblages which are diagnostic of three temporal divisions of Upper Great Lakes Historic sites; (1) Early Historic, 1610-1670; (2) Middle Historic, 1670-1760; and (3) Late Historic, 1760-1820. Three well-known sites are representative of the Middle Historic period: the Fatherland Site in Natchez, Mississippi, dating from 1700-1781; Old Fort Albany, James Bay area, Ontario, dating from 1680-1715; and Fort Michilimackinac, Emmet County, Michigan. The assemblage that Quimby considers diagnostic of Middle Historic period sites bears little resemblance to the Lasanen Site assemblage. On the other hand, beads diagnostic of Early Historic period sites (Sainte Marie 1, Midland, Ontario, dating from 1639-1649; and Ossossane, Simcoe County, Ontario, dating from 1624-1636) show no resemblance to the Lasanen Site material. On typological grounds alone, then, the information presented by Quimby is of minimal use in dating the Lasanen Site assemblage. If type and specimen illustrations were available for beads described from the above sites in Quimby's appendices, the periods and type diagnostics as described would undoubtedly have added significance.

The Womack Site, Lamar County, Texas, has been identified by Harris *et al.* (1965:287-363) as a French contact Indian site which was occupied from 1700 until 1729. This site produced several bead types which were also found at the Lasanen Site. Other beads from the Womack Site are identical to those produced from early contexts at Fort Michilimackinac. This may indicate that the terminal date for the Lasanen Site assemblage overlaps the early end of the Womack Site date (that is, 1700-1710). It should be pointed out, however, that these three sites vary considerably in space and that chronological assessment by comparisons of this nature may be suspect.

Pratt (1961) has recently published bead descriptions from 10 historic sites in the New York area. Four of these sites, the Shepherdson Site (1677-1710), the Whitney Site (1710-1745), the Cheeseborough Site (1745-), and the Lemery Site (1660-1677), produced beads which were also found at the Lasanen Site. In summary, Pratt considers Types 36 (60) and 85 from these sites to be diagnostic of the 1677 to 1710 period. These types are representative of Lasanen by Class A, Type 8 and Class C, Type 2, Variety *b*, respectively. This evidence further supports the above pre-1710 date assigned to the Lasanen Site assemblage.

Two points have been illustrated by the above comparisons: (1) certain bead types ("seed beads" and Cornaline d'Aleppo types) are of little use at present in the well-controlled temporal assessment of historic sites—these types occur at many sites which are widely separated in both time and space; and (2) a large portion of the bead assemblage from the Lasanen Site has not been previously described in

published reports. Thus, well-dated comparative material is rare and has made the temporal placement of the Lasanen Site beads difficult.

The beads described above are thought to represent a pre-1705 assemblage on the basis of the comparative data presented. The lack of certain bead types at the Lasanen Site which postdate 1700 on other well-dated sites has been the prime factor in assigning this terminal date. Support for the definition of an initial date for this assemblage is more difficult to recognize. A review of bead types from pre-1670 period sites which were not found at the Lasanen Site suggests 1670 to 1675 as an initial date for the Lasanen Site beads. The well-known *Paternoster* (chevron or star bead) as described by Woodward (1965:9-10) is a good example of a common pre-1670 period bead which was not found at the Lasanen Site. A time span between 1670 and 1705 is thus a suggested date for the Lasanen Site bead assemblage.