sequence which, though we did not make a point of it, modifies already much of the existing chronological approach to the prehistoric and historic Huron. Potential lines of analysis have been sketched, as has the convergence of discontinuities at the time of contact (in ceramics, houses and the like). The materials suggest a manifold approach to variation in terms of chronological change and of micro-environmental adaptation. We have managed to learn enough about the region concerned to suggest that our original judgments were, in broad terms, moving in a fruitful direction. It should now be possible to define the precise problems of change and adaptation which we must investigate, and to pursue the formulation of converging complexes analyzed through bone, stone, ceramics, houses and subsistence. At that point the overlap with ethnohistoric documentation will become most exciting.

~~A. E. Tyyska~~

SEVENTEENTH CENTURY HURON GLASS BEADS ca. 1615 - 1650 (per p. 102)

General Problems

A typological and chronological seriation of glass trade beads from contact and early historic period Huron sites is the subject of this report. This work is based on the collection of trade beads at the University of Toronto from the Indian village and ossuary of Warminster, now interpreted as Cahiague (BdGv-1), which was the main

site of Huron Indians from the early historic period (McIlwraith 1946 and Emerson 1965; 1968). The total number of glass beads from the site of Cahiague was 425. The site of Cahiague is being used as a base-line, i.e., the locality that Champlain visited in 1615, from which the comparisons of other sites in this report were made. Two other site localities, Maurice Site (BeHa-1) (Tyyska and Hurley 1969) had a total of 69 glass beads, and the Robitaille Site (BeHa-3) yielded 6 glass beads.

As the Maurice and Robitaille sites have only recently been investigated, there is an obvious lack of published information. The results of the excavations carried out at Cahiague have been subjected to only brief reports in the past two decades. As glass trade beads are a very diagnostic material cultural item of a very large assemblage they are of high importance because of their "intrusive character" and possible chronological value.

It is well-known that glass beads of European origin were traded from earliest historical times to the North American Indians. A number of sixteenth, seventeenth and eighteenth century finds have been reported from Indian villages and burial areas in North America. Their typological and chronological seriation has often been very generous and greatly dependent upon the researcher's subjective approach and description. At present no generally recognized terminology for glass beads has been established. The first attempt was by H. C. Beck (1928), and van der

Sleen's "A Handbook on Beads" (1967). The latter publication is of some help in the present research; however, it is based largely on prehistoric and protohistoric beads from Europe, Africa and Asia. The Handbook does present a very useful unified terminological scheme and dictionary of the most common terms used in English, French, German, Italian, Dutch and Polish.

At present a concrete and well-documented comparison of North American finds of glass beads and their European contemporaries is quite rare and is certainly due in part to a lack of attention to this form of analysis in Europe itself. Historic archaeology in Europe is just at its beginnings and it is at present mostly concerned with the history of technique and technology. The only exception among the analysis of trade beads from North America is the so-called chevron or star bead. It has been the centre of large discussions in European and African archaeology for the past several decades. This interest was centred around the problem of classic or non-classic provenience and did not include the American finds (Reinecke 1929 and Haevernick 1961). Its eventual historic date in these areas was of little concern to American archaeologists since their finds of star beads dated from early historic Indian sites (Hademan 1878).

Very little is known to date about manufacturing localities during the sixteenth and seventeenth centuries. The discovery of a seventeenth century glass bead factory

near Amsterdam has shed some light on the problem of origins (van der Sleen 1967: 108-118). Some of the types collected at this factory are similar to those found in the New World and the assumption as to the direction of trade has been borne out (Orchard 1929: Plate XII, and van der Sleen 1963). Further excavations in Europe and systematic studies of both archaeological and ethnographic specimens will hopefully bring out more information concerning other types of glass beads traded to the North American Indians. The need for such a study has been pointed out by K. Kidd (1954) but a study from the American side of the Atlantic Ocean is a difficult undertaking. Thus North American archaeologists have tried to find other ways to base their type evaluations and chronological placements and much has been centred around reports of beads from historically documented sites. This form of direct historic archaeological research has been briefly published (Wray and Schoff 1953; Gregory and Webb 1965; Pratt 1961; White 1967; Quimby 1966: 81-90, 183-196). It is known that certain types of glass beads were distributed over large areas of North America in early historic times and that designs changed quite frequently. It is just such a factor which promises a reasonable basis for a chronological seriation of glass trade beads.

This type of study is, therefore, very amenable to the geographically defined region of Historic Huronia. All three localities contain beads and as they are located between Lake Simcoe and the southern shore of Georgian Bay,

their geographical position is in Huronia. The records of Samuel de Champlain's journey into Huronia during the year 1615-1616 and the destruction and dissemination of the Ontario Iroquois by the League in 1649-1650 offers us a documented chronological period (Trigger 1960 and Tooker 1964). It is just such factors as these that stimulated the early archaeological interest in this region and large excavations have been conducted at the French mission site Ste. Marie I (Kidd 1949); Ossossane Ossuary (Kidd 1953) and at the Warminster-Cahiague locality (McIlwraith 1946 and Emerson 1968).

George Quimby, who has been very active in the study of historic and prehistoric aboriginal activity in the Great Lakes, has published a brief survey of the main types of glass trade beads. They are characteristic for certain broad intervals during the two hundred years from the beginning of the seventeenth to the beginning of the nineteenth century (Quimby 1966: 102-159). His seriation is, however, very general but it is useful as a departure point.

One important attribute of glass beads is their chemical make-up and this aspect of analysis has not been conducted in North America. In addition, all references to materials or technological production processes are either short and uncertain or based on recent analogies from Italy where a long tradition in bead making is known (Woodward 1967: 4-8). As an example, types of monochrome white tubular or elongate spheroidal beads are sometimes called "porce-

lain looking" or are just described as "white trade goods". It is known that the chemical properties of these beads differ in different periods and regions depending upon the components used for the raw glass and for decoration. For example, in northern Europe potassium rather than sodium became the dominant alkali from the beginning of the early Middle Age (Geilmann 1955). The composition of Venetian glass is predominantly soda-lime and this was also observed in early glass manufacture. This difference can also be recognized between beads from the seventeenth century Amsterdam factory and pieces originating from the old Italian glass centre in Murano (van der Sleen 1967: 108). Regional variations of raw material can also help in the definition of the origin of certain types of glass products. From the point of view of chemical analysis, specific samples of North American glass beads could bring about important information towards the clarification of regional distributions in both the Old and the New World.

Considering the above listed difficulties it is not possible to make a definitive statement as to results expected at the present time. A seriation of all forms of glass beads from the studied sites was accomplished, six main categories were established and these categories were further subdivided according to colour and decoration. These subdivisions resulted in 30 classifications. Sorting according to basic material was not feasible due to the lack of chemical analysis. Only colour, appearance, decora-

tion, size and profile were taken into account. The terminology used is a synthesis from the most used terms and the objective is to achieve formal accuracy. All objects were measured and the main categories described.

Types of Glass Beads

Type I - Tubular Bead

IA Monochrome opaque white or light grey.

IB Monochrome opaque blue.

IC Monochrome opaque dusky red or very dusky red.

ID Monochrome opaque black.

IE Opaque white with longitudinal very fine lines in red colour on the surface.

IF Opaque white with 3 groups of drawn slanted fine blue lines on the surface.

IG Polychrome opaque dark grey with coating in dusky red interrupted by parallel blue stripes bordered with white.

IH Opaque blue with longitudinal stripes in white colour on the surface.

IJ Polychrome opaque light green inside, the decoration of parallel longitudinal reddish brown and white stripes on the surface.

IK Polychrome opaque white with longitudinal dusky red and blue stripes on the surface.

IL Opaque dusky red, twisted.

IM Opaque light blue, quadratic shape.

Type II - Elongate Spheroidal Beads

IIA Monochrome opaque white or light grey.

IIB Monochrome opaque blue.

IIC Monochrome opaque black.

IID Polychrome opaque dusky red with 3 blue stripes bordered with white on the surface.

IIE Polychrome opaque dusky red, the decoration of longitudinal blue stripes bordered with white on the surface, the shape is longishly flattened.

Type III - Oblate Spheroidal/Globular Beads

IIIA Monochrome opaque white or grey.

IIIB Monochrome opaque blue.

IIIC Monochrome opaque turquoise blue.

→ IIID Polychrome opaque dusky red, with decoration of 3 blue stripes bordered with white. Around the perforation is drawn a black centre.

IIIE Polychrome opaque dusky red or dark reddish brown, the decoration of 3 wide blue stripes bordered with white on the surface.

→ IIIF Opaque dusky red with opaque black or green core around the perforation, so-called Cornaline d'Aleppo.

IIIG Eye bead.

IIIH Opaque dark blue with the decoration of white twisted stripes.

Type IV - Star or Chevron Bead

IVA Polychrome opaque, elongate shape, diameter from 20 mm. - 30 mm..

IVB Elongate or oblate form, faceted surface, diameter 10 mm. - 15 mm..

IVC Small elongate form, traces of parallel furrows on the surface.

Type V - Faceted Bead

VA Multifaceted translucent white, globular shape.

Type VI - Raspberry Shaped Bead

VIA Opaque ivory, a plastic ring in the middle of the bead vertical to the perforation.

Preliminary Observations on Warminster-Cahiague Beads (BdGv-1)

Of the total amount of 425 completely or partially preserved glass beads from this site the most numerous group is the Type IA (Table 10) - tubular monochrome opaque white. Their diameter ranges between 2.1 mm. to 5.7 mm. and this type of bead represents the so-called "drawn beads" whose manufacturing process is known from recent Italian productions (van der Sleen 1967: 23-26). This form of production is known for glass beads of varying colours and shapes, producing a cross-section which appears to be restricted to round and oval. Within the group studied from Cahiague oval cross-sections were observed on white beads only. Of the longer glass beads or tubes they appear to have been cut rather irregularly or partially perpendicular to their long axes, or even with angled cuts into various lengths ranging from 6 mm. to 18.5 mm.. This irregularity of length and shape indicates that there was a lack of care being paid to their production. Of the 172 beads examined under Type IA, 37 were damaged by other breakage or fire. Type IB - tubular opaque blue - is represented by 30 specimens of which 13 have slight breakage or fire damage. Type IB is also a drawn bead whose diameter ranges between 2.0 mm. and 4.0 mm. and length ranges between 8.8 mm. and 18.0 mm.. There are slight differences in appearance in these beads in that five have a dark blue polished surface, with the remaining having an opalic blue surface. Type IC - tubular opaque dusky red - and Type ID - opaque black - are represented by

one specimen each and no observations will be made here as a single representative of each type offers little in the way of comparisons. Type IE - tubular opaque white with regular longitudinal red lines - and Type IF - tubular opaque white with 3 groups of slanted fine blue lines - are each represented by one example and they are presumed to be derived from the Type IA. Type IG - tubular polychrome opaque dark grey with dusky red coating interrupted by parallel blue stripes bordered with white - were all damaged. This sample consists of 20 specimens and in spite of their damaged nature it is clear that they were very large with their diameter originally ranging from 6 mm. to 11 mm. and their length appears to be longer than any others in that some measured up to 48.0 mm.. The blue striping bordered with white appears to be repeated four times in equidistant areas on the surface of the beads. Additional polychrome glass beads from Types IH (6 specimens); IJ (2 specimens); IK (1 specimen); are very damaged and in a fragmental condition and thus nothing can be said at this time. It is presumed that the beads of Types IG to IK were drawn out of one tube and decorated with different coloured stripes during their hot stage, with the stripes added to the tube through a rolling process.

Type IIA - elongate spheroidal opaque beads. One hundred and six pieces of this type were recovered from Cahiague and they have an oval cross-section which ranges in size from 3.3 mm. to 8.1 mm.. These specimens range in

length between 5.5 mm. and 12.9 mm.. Two exceptional shapes appear to be a barrel form and a small seed form. The basic material appears to be the same as Type IA; however, the Type IIA specimens have a higher frequency of polished surfaces. One minute attribute was observed in that these beads appear to change hues from one end to the other and it is believed that this is a bi-product of production rather than decoration. Type IIB - elongate spheroidal opaque blue beads. Forty-eight beads are classed as belonging to Type IIB. They appear to form a transition between two other types as they resemble Type IIA in shape and Type IB in material. Their size range is larger than these types in that Type IIB has a diameter range from 2.0 mm. to 11.2 mm. and a length range from 5.0 mm. to 19.1 mm.. Type IIC - elongate spheroidal opaque black bead. Only one example of this type was recovered from the Cahiague site. Types IID and IIE are polychrome beads. The basic colour is a dusky red which is then decorated by longitudinal blue stripes bordered by white stripes.

Types IIIA to IIIC - oblate, globular; spheroidal beads. The distinguishing characteristic of this group is its shape which is different from those of the other types. These beads are made of the same material and have the same decoration features as those in Types I and II. While these beads appear to be smaller in size, there are examples within the sample whose size ranges into those recorded for Types I and II.

Types IVA to IVC - star or chevron beads. This type is represented by three examples from Cahiague. These beads vary in size but the manufacturing process appears to be the same. Star beads consist of six layers of different glass colours. The core is light green which is then followed by white, dusky red, white and then blue layers. The surface is then cut irregularly, namely towards the ends, which forms the decoration. A specimen of Type IVA is a broken fragment and its size cannot be ascertained.

Type VA and Type VIA are represented by one fragment only.

The beads listed here were recovered from the excavations of a very large palisaded village site and ossuary which was occupied at approximately A.D. 1615 (Emerson 1968). Comparisons of all the available beads from the viewpoint of their respective locations in middens, houses, and subsurface pits were not attempted as their total context has not as yet been described. It is hoped that this study will serve a twofold purpose in that: (1) it will illustrate what has been found at one site which is fairly firmly fixed in time, and (2) that it will be of an aid in the subsequent analysis of this site.

Preliminary Observations on Glass Trade Beads from Maurice Site I (BeHa-1)

Excavation of the Maurice Ossuary (Jerkic, this report) produced 69 historic glass beads. Several types of beads are

similar to those recovered from Cahiague but there are examples (Types IIIF, G and H) which were not found at Cahiague (Table 10).

Type I tubular beads are represented at Maurice by only one variety, i.e., Type IC which is dusky red with a highly polished surface and which is round in cross-section. A total of 12 beads belong to Type IC and in addition two small fragments were recovered but at this time it cannot be precisely stated if they are fragments from larger forms or if worn into their present shape. Four examples (squares W8N2, W8N4, and W6N6) were perpendicularly cut from one slightly irregular tube which had a diameter of 3.8 mm. to 4.0 mm.. The length of the longest bead is 49.0 mm.. The remaining beads were cut from tubes which had diameters between 4 mm. and 5 mm.. Examples recovered from Burial 17 are smaller in size and slightly damaged and they appear to have been cut on the bias without much care; however, all are very similar.

Type III - oblate, spheroidal or globular beads, are represented by only four variations. Type IIIC - monochrome turquoise blue glass beads, are represented by six specimens. There are small differences between these specimens in shape and length and the diameter ranges between 5 mm. and 7 mm.. Around the orifice on four examples one can discern slight differences in the raw or source material and on two other examples wear marks are apparent. Type IIIF consists of the basic dusky red formed around a black perforation. This

form is the so-called Cornaline d'Aleppo and it is represented by 42 examples. Type IIIF appears at Maurice in three basic sizes:

1. Seed bead, diameter 2 mm.; one recovered from Burial 17.
2. Beads with a diameter of 4 mm.; 33 examples.
3. Beads with a diameter of 7 mm.; 8 examples.

The shape of these specimens changes from globular to barrel or a flattened shape. The diagnostic black core may also have been painted on in some instances. Type IIIG represents a unique find since it is of the type called "stratified eyes" (Eisen 1916: 5-6). This specimen is unique in the sense that into the basic blue material were forced four drops of white glass which have green centres. There are three marks visible on this particular specimen. Type IIIH is also represented by one specimen only. Into the basic dark blue material of this bead were forced three slanted white glass stripes.

Type IV - star or chevron beads. Seven examples were recovered from BeHa-1. Of these examples six have diameters ranging between 3 mm. and 4.5 mm. and they are classed as belonging to variation Type IVC and one has a diameter of 13 mm. and it is classed as belonging to variation Type IVB.

Preliminary Observations on Glass Trade Beads from the Robitaille Site (BeHa-3)

Six glass beads were recovered from the testing operations at the Robitaille Site. Two examples from Type I (Types IL and IM) are present here and not present at Cahiague.

Type I - a tubular bead represented by one polychrome fragment of the variation Type IK. The slanted cutting is somewhat questionable as it may be a bi-product of manufacturing or it may represent subsequent damage. Type IL is a tubular twisted bead and it appears to be a large specimen as it has a diameter of 7 mm.. It, as the variety IK, has questionable cuttings. Type IM has a quadratic shape and an opaque light blue colour. This one specimen is considered to be exceptional in that it appears to be made from two materials, that is the core being solid white while the coating has an asbestos-like texture.

Type II is represented by one elongate spheroidal bead which is well preserved and classed as Type IIE.

Type IIIC is a globular turquoise blue bead.

Type IVC is a star bead with a barrel shape which appears to have been made of the same source material as those recovered from Maurice Site I (BeHa-1).

Interim Observations

The large collection of historic glass beads from the site of Cahiague has served as a seriational departure point for this preliminary study of the development of trade items in a narrowly defined geographic area and one bracketed in time (1615 - 1650). Preliminary sorting of the Maurice and Robitaille collection indicates different trends in types of beads and differing occurrences of beads. These trends, however, cannot be supported until all the excavated

Type	Warminster-Cahiague	Maurice	Robitaille
IA	172		
IB	30		
IC	1	12	
ID	1		
IE	1		
IF	1		
IG	20		
IH	6		
IJ	2		
IK	1		1
IL			1
IM			1
IIA	106		
IIB	48		
IIC	1		
IID	4		
IIE	2		1
IIIA	12		
IIIB	9		
IIIC	2	6	1
IIID	1		
IIIE			
IIIF		42	
IIIG		1	
IIIH		1	
IVA	1		
IVB	1	1	
IVC	1	6	1
VA	1		
VIA	1		
Total	425	69	6

TABLE 10

sample is examined and all sites within the area of Huronia now under investigation are considered and compared with the site of Cahiague.

Karla Motykova

ARCHEOMALACOLOGY IN SOUTHERN ONTARIO

Archeomalacology is a comparatively new technique for archeo-climatic and -ecologic-studies, and it is being applied for the first time in the present multi-directional study of Ontario prehistory.

The technique is basically quite simple. It involves the collection and analysis of shells of gastropods, primarily terrestrial, recovered from occupation and ossuary (burial) sites in southern Ontario. Snails are peculiarly useful in these respects for several reasons:

1. The shells are quite hard and strong. They appear to resist weathering and soil chemical action better than do larger bones.
2. Related to point 1. is the fact that snails are, with only a very few exceptions, extremely small. Most specimens, usually more than 90 percent of a sample, are less than 6 mm. in greatest diameter. This means, therefore, that they slip easily between the grains of coarse soils, and even being stepped on will frequently not damage the shells. It also means that we may eliminate the probability of human selection of