

## Life and Death at the Quarry: The Early Woodland Archaeology of the Peace Bridge Site

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In the past several decades, archaeologists have made gradual progress in understanding life during the Early Woodland period in New York State and Ontario (Ferris and Spence 1995: 89-97; Granger 1978a; Ritchie 1980; Ritchie and Funk 1973; Spence and Fox 1986; Spence et al. 1990). Recent investigations by Archaeological Services Inc. (ASI) of the Peace Bridge site, located on the Canadian side of the international bridge linking Fort Erie, Ontario with Buffalo, New York (Figure 1), have provided opportunities to augment this understanding, at least for the Niagara Frontier (ASI 1993, 2001, 2004a, 2004b, 2005; Williamson and MacDonald 1997, 1998; Williamson et al. 2006). That this region was home to Early Woodland populations was documented in detail by Joseph Granger (1978a), who defined the Early Woodland Meadowood Phase (ca 2800 – 2400 BP) in western New York State in terms of a complex pattern of settlement, inter-regional exchange and mortuary ceremonialism. His excavations at the large Riverhaven site complex on Grand Island and the nearby Sinking Ponds site revealed dense and varied artifact assemblages relating to resource exploitation and stone tool manufacturing. He organized these and many other sites into local territories, arguing that each was populated by a small band, which in turn was involved in local and distant inter-regional interaction.

Granger proposed a regional settlement-subsistence system focused on hunting, fishing and gathering wild plant foods, involving small, spring and summer fishing camps situated near marshes that were formerly shallow embayments of Lake Erie, along with large macroband fall and winter occupied settlements, located on large streams and lakes and situated strategically to exploit deer and other animal and plant resources. He argued that

while hunting and gathering were important economic activities, the Niagara Meadowood harvesting calendar would not have been complete without the seasonal catches of fish from lakes and rivers. While fishing occurred throughout the year, spawning runs significantly increased the potential yield in spring and fall.

In the immediate Fort Erie area, this settlement-subsistence system may have involved deer hunting and nut collecting locations being situated in the interior as groups were unlikely to have spent the late fall and winter on the exposed shores of Lake Erie. At least one large Meadowood settlement (Hamlin [AfGs-52]), which exhibits evidence of an extensive lithic industry, has been identified in the interior on the Crystal Beach Moraine, which once overlooked the Point Abino wetland, now a wetland forest that has been reduced substantially in size over the past two centuries. During the Early Woodland period it may even have been associated with a shallow embayment of Lake Erie although the site would have been in a protected location (Cooper 1985).

The Peace Bridge site represents another facet of the Meadowood settlement-subsistence system in the Niagara frontier — that of the lithic quarry-related campsites. The site locale is a major source of Onondaga chert. Investigations over the past fifteen years at the site have yielded considerable evidence of stone tool making and caching as well as other economic pursuits such as fishing and hunting. These activities have left behind many of the diagnostic artifacts of the Meadowood phase (Spence et al. 1990:128-129), including Vinette 1 ceramic vessels, caches of exquisite preforms made from Onondaga chert, as well as ground stone objects such as a pop-eyed bar birdstone and trapezoidal-shaped gorgets.

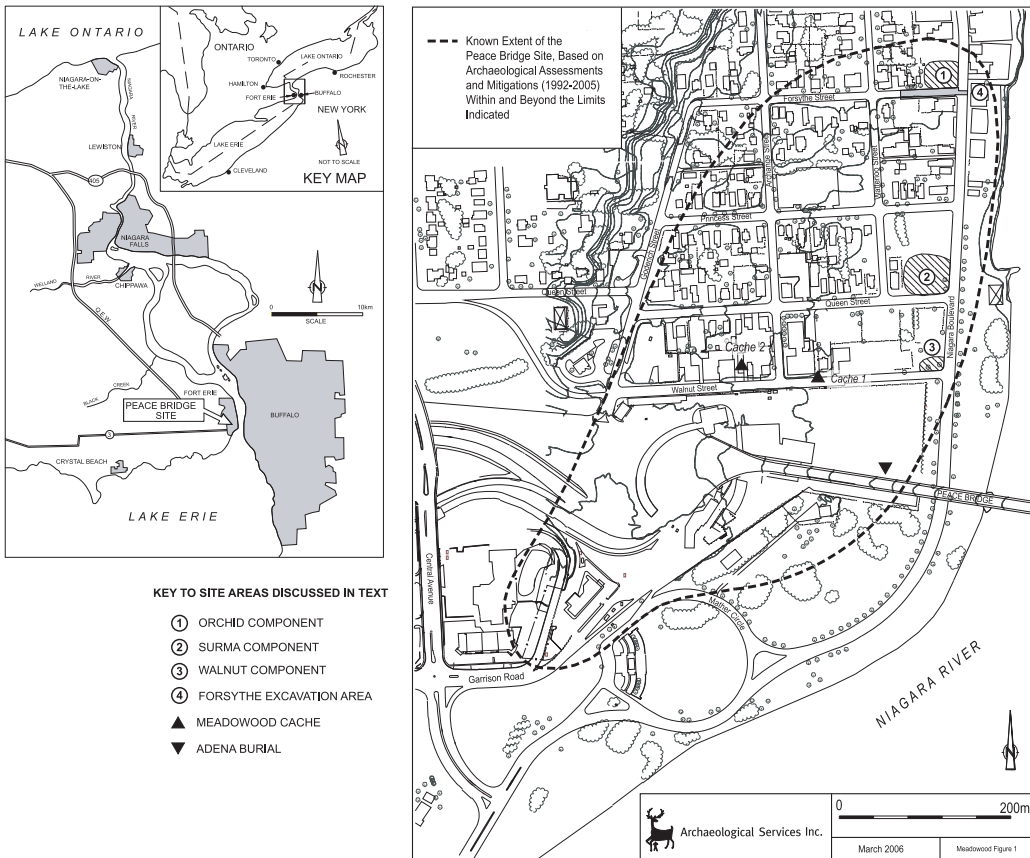


Figure 1. The location and extent of the Peace Bridge site within the Town of Fort Erie.

Also common throughout northeastern North America, and at the Peace Bridge site, was the application of symbolically important red ochre (ground iron hematite) to human remains and grave offerings of objects that required considerable time and skill to make. Moreover, the nature and variety of these grave goods, including those made from exotic materials, suggest that members of the community outside of the immediate family of the deceased provided mortuary offerings, implying relatively broad social or community ties. These trends are evident during both Meadowood and the subsequent Middlesex phase (Ritchie 1980; Spence et al. 1990), although this later phase is almost entirely known in Ontario for its elaborate mortuary complex. Adena phase projectile points, diagnostic of this period, are found throughout the Niagara area and on the Peace Bridge site, sometimes manufactured from

Flint Ridge chalcedony evincing a direct link to the Adena heartland in the Ohio Valley. Moreover, a blocked-end stone tube pipe, made of Ohio limestone and also diagnostic of this period, was found with one of the Peace Bridge site burials.

While there is only limited evidence of Middlesex period occupation of the site, there appears to have been substantial use of the site by Meadowood populations. As it is one of the largest and most densely occupied sites of its kind, it likely functioned as a central manufacturing and distribution centre from which objects, particularly those made of Onondaga chert, were circulated to Early Woodland bands throughout the Great Lakes region. This paper is intended to summarize the evidence for Early Woodland occupation of the site and to explore briefly the socio-political implications of such a site function.

### The Archaeology of the Peace Bridge Site

The first archaeological investigations conducted in the Fort Erie area occurred in the late 1800s and early 1900s and are known primarily from museum accession records from institutions in Buffalo and Toronto. While David Boyle, the father of Canadian archaeology (Killan 1983), visited the area in 1887, during his initial season as Provincial Archaeologist for Ontario, the first focused research in the region was undertaken by Frederick Houghton of the Buffalo Museum of Science, who compiled a list of sites in the Niagara Frontier for the Buffalo Society of Natural Sciences (Houghton 1909). Among other sites, he identified “a continuous occurrence of cultural debris extending along the bank of the Niagara River” (Houghton 1909:320). He also identified a specific site between the village of Fort Erie and the ruins of Old Fort Erie, along the banks of the Niagara River, where he again referred to the beach as “one continuous refuse heap.” Almost seventy years later, Joseph Granger (1976) described this feature as the Niagara River sheet midden, extending from one end of Fort Erie to the other and representing the accumulated refuse of many cultural groups over thousands of years. The presence of this feature is due to the relative accessibility of chert, which outcrops extensively on most of the north shore of Lake Erie from Fort Erie to Nanticoke. In these locations, Onondaga chert would have been available in abundance to aboriginal peoples. The Peace Bridge site represents a primary quarry area within this outcrop. While Onondaga chert was a key raw material in the flaked stone industries of southcentral Ontario and western New York throughout prehistory, it was favoured by Meadowood groups to such a degree that it was likely regarded as having particularly strong social and symbolic significance as well (Ellis et al 1988:183; Granger 1978a:237-238; Ritchie 1980:183). Accordingly, any major source of Onondaga chert during Meadowood times would have acquired a heightened importance in regional exchange and ideological systems beyond that ascribed to it as just another source of raw material for stone tool manufacture.

The first sustained investigation of the Peace Bridge site occurred in July of 1964, when workmen uncovered human bone and associated cultural material while grading a portion of the first terrace adjacent to the Niagara River near the intersection of Forsyth Street and Niagara Boulevard in downtown Fort Erie (Figure 1). Known as the Orchid site (AfGr-1), the find generated immediate international interest as archaeologists came to investigate it from Buffalo and from the National Museum of Canada in Ottawa. The site consisted of a large Iroquoian ossuary containing over 300 burials, as well as a secondary burial area, both of which were situated in an extensive, buried, organic palaeosol. The excavations produced Late Archaic, Early Woodland, Transitional Woodland, Late Woodland and historic Iroquoian artifacts in addition to fourteenth and seventeenth-century Iroquoian burials (White 1966; Granger 1976; ASI 2001).

In the spring of 1965, a second locality within the Peace Bridge site, was accidentally uncovered, 250 metres to the south of the Orchid component, during renovations to the Queens Hotel, formerly located at the corner of Queen Street and Niagara Boulevard. Known as the Surma site (Figure 1), the subsequent excavations there were directed by J. Norman Emerson of the University of Toronto, assisted by William Noble. Cultural material and burials, representing the Archaic to early Late Woodland periods, were recovered (Emerson and Noble 1966). Many of the burials contained long distance trade goods such as columella shell beads, platform pipes and slate gorgets. The site also contained a major Late Archaic (Broadpoint) component (ca. 3800 BP), including one of the largest concentrations of Genesee spear heads in the Lower Great Lakes region (Emerson and Noble 1966). The presence of pentagonal preforms for this tool type suggested to Ian Kenyon (1981) that these tools were being manufactured at the site (see also MacDonald and Steiss 1997).

Emerson and Noble's (1966) discussion was based only on preliminary examinations of a sample of the assemblage. In fact, much of the material has never been processed and remains in

storage at the Department of Anthropology, University of Toronto. The material that was reported upon and illustrated in the 1966 article, however, includes a large sample of stone tools, including Meadowood projectile points and a Meadowood biface (Emerson and Noble 1966: Plates III, IV, 78).

A new component immediately to the south of the Surma area was registered as a result of archaeological resource assessments conducted in 1992 and 1993 (ASI 1993). The Walnut site (AfGr-7) was documented during the demolition of the garage and residence at 9 Walnut Street, on the northwest corner of Walnut Street and Niagara Boulevard, one block south of the Surma site (Figure 1). A single one metre square test unit, placed on an undisturbed portion of the property, yielded over 4,000 artifacts. Profiles of the walls of the unit revealed complex stratigraphy involving a number of buried soil layers. Most importantly, a black organic soil was detected at a depth of 40 centimetres extending to 50 - 55 cm below surface. This layer corresponds with the "Niagara river sheet midden" identified by previous researchers at Orchid and Surma. Pre-contact pit features had clearly been excavated through this layer to the light-brown sandy soil below.

The principal observation resulting from the excavations at Walnut was that the black organic layer, recorded on all of the above sites, contains cultural debris resulting from numerous occupations over a 3,500 year period. It was also concluded, at that time, that this layer extended from south of Walnut Street to north of Forsythe Street and that a new site, called the Peace Bridge site (AfGr-9), should be designated. This new site encompasses the previously documented Orchid, Surma and Walnut sites (Figure 1).

The extent and nature of the layer in the downtown core of Fort Erie was further defined in 1994 during routine archaeological assessments of sanitary sewer and water main construction projects. During this work, test units were placed through road and sidewalk surfaces in the area between Queen and Forsythe Streets. This resulted in the documentation of the eastward extent of this deposit across the road to encom-

pass all of the sidewalk area on the east side of the boulevard. Most important was the discovery that significant deposits remained intact immediately below the pavement and concrete/gravel bed of the roads and sidewalks (MacDonald 1997).

Further investigations, situated within Niagara Boulevard at the intersection of Forsythe Street and Niagara Boulevard, yielded evidence of a wall of a house structure and 27 pit features, all under the surface of the road. The features contained dozens of chert tools, hundreds of fragments of ceramic vessels and thousands of animal bones. The chert tools and ceramic vessels indicate two major occupations in this area, one during the Transitional Woodland period (ca A.D. 700) and the other during the Early Woodland period. Almost 25,000 chert flakes, discarded in the manufacturing of stone tools, were also recovered (MacDonald 1997:74-79). Further excavations along Forsythe Street just west of Niagara Boulevard, resulted in the documentation of dozens of features and post moulds, over 1000 flaked stone tools (spear heads, scrapers and drills), several hundred ground stone tools (axes and netsinkers), hundreds of ceramic vessel fragments and thousands of small animal bones dating to the Late Archaic, Early Woodland, Transitional Woodland and Late Woodland periods. This area represents one of the richest zones of the Peace Bridge site (ASI 2004a; 2005).

In 2003, twelve one-metre square units were excavated within the entranceway to the Riverwalk Trail for the Town of Fort Erie on the south side of Niagara Boulevard across from the T-intersection with Forsythe Street. A total of 255 museum quality tools was recovered from the twelve units. As well, in order to obtain a representative artifact sample and to determine artifact density, all artifacts encountered within one of the units were retained. The total recovered assemblage weighs 27.2 kg, which represents 10,000 to 12,000 artifacts — the highest yield per square metre yet documented at the Peace Bridge site (ASI 2004b).

Approximately 120 square metres of excavation was also undertaken for the Buffalo and Fort Erie Public Bridge Authority in 1994 in advance

of their construction of a large commercial customs processing centre on the southwest corner of Queen Street and Niagara Boulevard. It was decided, early in the design process, to place the building on footings rather than to excavate a full foundation, since the former process would pose less of a threat to the archaeological deposit. Fifty pit features were excavated within test units placed at the locations of the footings, yielding approximately 141 kg of chert flakes from the palaeosol overlying the features. In addition, almost 10,000 tools and chert flakes were recovered from the features (Williamson 1997).

In 1995, work centred on deposits that would be impacted by the resurfacing of the commercial truck yard, installation of various services, and landscaping features. While several hundred pit features were recorded, it was necessary to excavate only about a third of these as the others could be protected from any future disturbance. The features contained hundreds of chert tools and fragments of ceramic vessels and thousands of animal bones (mainly fish and medium to large sized mammal) (MacDonald and Williamson 1997).

In 1997, excavations were conducted in advance of the proposed twinning of the Peace Bridge. One of the trenches extended eastward from the truck yard thereby providing a cross-section that led out from the southeastern edge of the site into what was the former channel of the Niagara River. Following this profile from west to east, it was possible to see precisely where the pristine lower palaeosol disappeared and was replaced by naturally formed riverine sediments atop bedrock in the first few metres of the trench. Within this sand layer were found “ripple” patterns similar to those formed by the gentle lapping of water along a beach, providing direct evidence for the location of the riverbank at the time of the earliest surviving occupational remains at the site (3800 BP), or possibly even evidence of a bay or inlet that was comparatively sheltered from inundation associated with higher lake levels several thousand years earlier (Austin 2006:72).

Also, a vertical limestone bedrock scarp that appears to have been a primary mining locale was

encountered. The bedrock exposure consisted of an approximately one metre high face of limestone that contained several beds of black to grey nodular chert. Close examination of the layers of interbedded chert and limestone on the face revealed many scars where large pieces of chert had been removed. An apparently undisturbed and unconsolidated deposit of chert flakes and shatter, worked tools and large chert cobbles had accumulated on the surface of the pavement. These findings suggest that this area was a primary mining location for the extraction of raw material. Although the numbers of formal tools on top of the bedrock ledge averaged perhaps two or three per one-metre square, the first eight metres below the face yielded not only a greater number of chert flakes related to the early stages of tool production, but also no less than 70 non-diagnostic stone tools, two netsinkers, six hammer stones and one Genesee spear head. In addition, tens of thousands of chert flakes were encountered in each one-metre square. Clearly this was an area of intensive chert reduction and tool-making. The discovery of this mining area confirms that many of the scattered chert blocks found throughout the Peace Bridge site were deliberately removed from the Onondaga formation rather than being naturally detached by forces such as wave action and cryoturbation (Austin 2006:75).

In 2001, excavations along the north and south side of Walnut Street, yielded evidence of several Early Woodland features, one of which contained a rare and complete birdstone. The three surrounding features contained red ochre stained artifacts, animal bone, and Meadowood bifaces (ASI 2004c).

In total, more than one million artifacts have been recovered from the Peace Bridge site. The primary occupations of the site occurred during the Late Archaic Genesee, Early Woodland Meadowood, Transitional Woodland and Late Woodland periods. People were clearly at the site to quarry the Onondaga chert that outcrops at that location, to fish and hunt, and to bury their dead as is attested to by the hundreds of burials that have been documented on the site. It would appear that thousands of stone tools, including

spearheads, knives, scrapers and drills, were being manufactured on the site throughout the first three of these general periods. The site extends continuously below the surface of the roads, sidewalks, lawns and parking lots west from the Niagara River for some 400 metres, from south of the Peace Bridge north for approximately 600 metres, thereby encompassing an area of about 30 hectares (Figure 1).

It is possible that the apparent scale of the Genesee and Meadowood occupations, which are the best represented components in terms of formal tools recovered from the site, are in part a consequence of technological considerations (i.e., the need for large flaw free pieces of material for the manufacture of large broadpoints) or ideological preferences for Onondaga chert (as seems to have been the Meadowood case) but there are other factors to consider. It seems likely that between circa 5600 and 3800 BP, the higher water levels of the Nipissing rise completely inundated the lower terrace of the Niagara River (Pengelly et al. 1997; Tinkler and Pengelly 1995). Not only would these high waters have rendered the area of the site inaccessible for much if not all of this period, it seems that they have scoured away evidence of any earlier archaeological components. Likewise, the virtual absence of evidence for Middle Woodland activity may be attributable to inundation of the site resulting from meteorologically produced lake-level fluctuations circa 600 A.D. (Pengelly et al. 1997; Tinkler and Pengelly 1995).

### Flaked Lithic Tools

The site has yielded an extraordinary number of stone tools. Since the Archaeological Services Inc. excavations began, we have recovered over 7,400 bifaces and 1,246 formal tools. Next to Late Archaic Genesee forms (29.5%), the most common diagnostic stone tools recovered from the site are the almost 270 Meadowood projectile points, drills, and bifaces or “cache blades.” These constitute 21.4% of the formal tool assemblage, second only to Genesee diagnostics (Table 1). Sixty-eight of the Meadowood bifaces were found

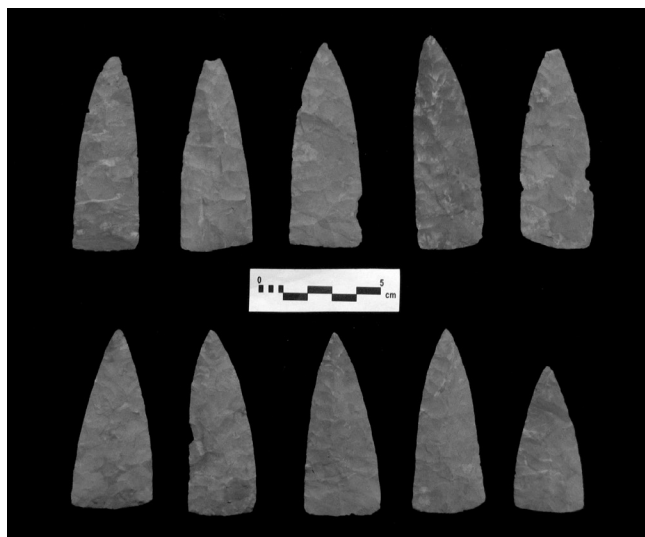
in two caches of 30 and 38 pieces (Figures 1 and 2). The remaining bifaces and the were found in various excavation units or features and are considerably smaller in size than those objects found in the cache of 30 items (MacDonald and Steiss 1997:330). The thickness of all of the specimens is remarkably uniform, however, reflecting the high level of refinement of both preforms and projectile points.

**Table 1.** *Formal tools recovered from the Peace Bridge site during major infrastructure projects between 1993 and 2003.\**

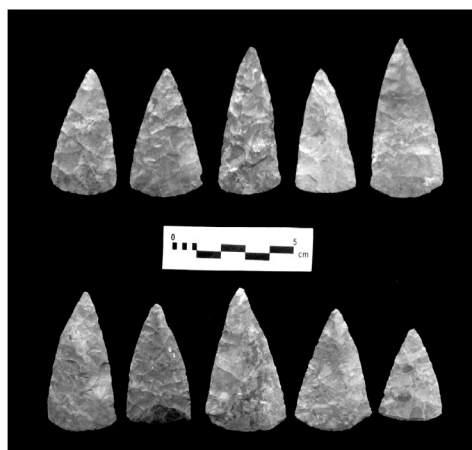
Period	Total	%
<i>Late Archaic</i>		
Lamoka	13	1.0
Normanskill	5	0.4
Bare Island	2	0.2
Undetermined Narrow Point	1	0.1
Genesee	367	29.5
Adder Orchard	18	1.4
Perkiomen	10	0.8
Susquehanna	4	0.3
Hamilton	1	0.1
Undetermined Broad Point	4	0.3
Crawford Knoll	28	2.2
Orient Fishtail	1	0.1
Innes	21	1.7
Ace of Spades	11	0.9
Hind	8	0.6
Undetermined Small Point	3	0.2
<i>Early Woodland</i>		
Adena	4	0.3
Meadowood	267	21.4
<i>Middle Woodland</i>		
Vanport	1	0.1
Port Maitland	1	0.1
<i>Late Woodland</i>		
Triangular Point Forms	93	7.5
<i>Undetermined</i>	383	30.7
<i>Total</i>	<i>1246</i>	<i>99.9</i>

\*based on: ASI (2004a, 2004b, 2004c, 2005); Austin and Jenkins (2006); MacDonald and Steiss (1997).

**Figure 2.** Selected complete specimens from Peace Bridge Caches 1 and 2.



SELECTED REPRESENTATIVE BIFACES: PEACE BRIDGE CACHE 1



SELECTED REPRESENTATIVE BIFACES: PEACE BRIDGE CACHE 2

### *Caches*

Almost 40% of the more than 100 caches of flaked stone tools in the published archaeological literature of the Northeast date to the Early Woodland period (ca 2800 - 2400 BP) although there is clearly a long tradition of caching stone tools as evinced by Paleo-Indian examples (Williamson 1996).

Onondaga chert Meadowood bifaces were exchanged throughout the Northeast during the Early Woodland period (Granger 1978b; Williamson and Fox 1989). They have been

located in eastern Quebec (Chalifoux and Burke 1995), as far east as Connecticut and Vermont (Granger 1981; Loring 1985), and also occur regularly to the west in Michigan (Garland and Beld 1999:131). Meadowood style bifaces produced out of local materials have also been found in the Canadian Atlantic Provinces and Maine which suggests that Meadowood technology was reaching the far Northeast (Allen 1982, Chretien 1995; McEachen, 1995).

While many of these occur in burial contexts, over 48% of all Meadowood caches were found in apparently isolated contexts, away from both burial and habitation sites. The two Peace Bridge

caches, alternatively, are unique in that they occur on a quarry site, adjacent to both habitation and burial features. Defining their specific context is therefore difficult.

The correlation of numerous Early Woodland caches with wet sites is also of interest given the location of the Peace Bridge site adjacent to the mouth of the Niagara River. Thirty percent of Meadowood caches were situated on lake shores or river banks. Even more noteworthy, however, is the fact that almost a third of all Adena caches were recovered from the bottom of bogs or swamps, a practice that is reminiscent of some of the ritual offering behaviours of European Neolithic and post-Neolithic populations (Williamson 1996). While the Peace Bridge site is adjacent to the river/lake shoreline, and perhaps was even inundated at times due to periodic flooding (Pengelly et al. 1997), their quarry context is likely more important as they represent among the first well documented caches found at a quarry site.

The first Peace Bridge cache (Cache 1) assemblage consists of 30 complete or near complete bifaces (McEachen et al. 1997:334-339). They were found in a large, 40 cm deep pit filled with dark grey soil. The bifaces were found dispersed randomly in the upper 20 cm of the north half of the feature. Their orientation and the presence of debitage, perhaps relating to their manufacture, suggest that they were not placed within the feature in a bag or small container. Some of the bifaces exhibit transverse snaps, probably resulting from bending fractures during late stage thinning. The inclusion of the odd broken item in Meadowood caches is reported elsewhere (see below). One presumes from a utilitarian perspective that they were included because such fragments were still useable as they could be made into typical Meadowood tools such as bifacial end scrapers and strike-a-lights. All of the preforms were skilfully and completely flaked creating straight margins and only one specimen shows any sign of use-wear. Of considerable interest, however, is the observation of two directions of regular oblique pressure-flaking suggesting the presence of at least two knappers contributing to the cache (Stewart 1997:365-369).

The average length of the analyzable specimens from this feature is 79.4 mm with a range of 59.9 mm-91.9 mm. The mean width is 30.06 mm with a range from 27.4 to 36.4 mm, and the average thickness is 6.39 mm with a range of 5.7 to 7.2 mm. These specimens are not only longer, wider and thicker than specimens recovered elsewhere at the Peace Bridge site but also, on average, larger than the bifaces found in other Northeast caches. Indeed, bifaces typically range in length from 50-65 mm, in width from 25-29 mm and 5-6 mm in thickness (Chretien 1995).

The second Peace Bridge cache of 38 artifacts (Cache 2) was found about 80 metres west of the first cache (Figure 1), in a large feature measuring 155 cm in length, 110 cm in width and approximately 112 cm in depth, which had been intruded on by a smaller Euro-Canadian refuse pit. The pre-contact feature was ovate in plan with a primary matrix of medium brown sand mottled with yellow-orange sand. Three pockets of red ochre extended from the top of the feature to the bottom, although it was most concentrated toward the bottom of the feature. All but six of the bifaces were piece plotted revealing a concentration of artifacts at a depth of 69-100 cm. A tight cluster of 13 bifaces, in a small area measuring 22 by 18 cm, suggests that these may have been placed in the feature in a bag or container, which was subsequently disturbed resulting in the dispersal of the other pieces. While red ochre was often used by Meadowood peoples in burial contexts (Williamson 1980), there was no bone or other artifacts in the feature although a feature about five metres away contained a disturbed burial, the remaining portion of which was an adult cranium resting on a red-ochre stained soft white rock.

All of the bifaces in Cache 2 were skilfully flaked creating highly refined pieces with straight margins. Many of the bifaces show parallel flakes meeting along medial ridges on one side with more extensive flaking on the opposite sides. Most were completely flaked although a few still have primary detachment scars. There is a wide variety of shapes and sizes in the cache, some perhaps caused by masses in the blanks, indicating that the knapper was not worried by varia-

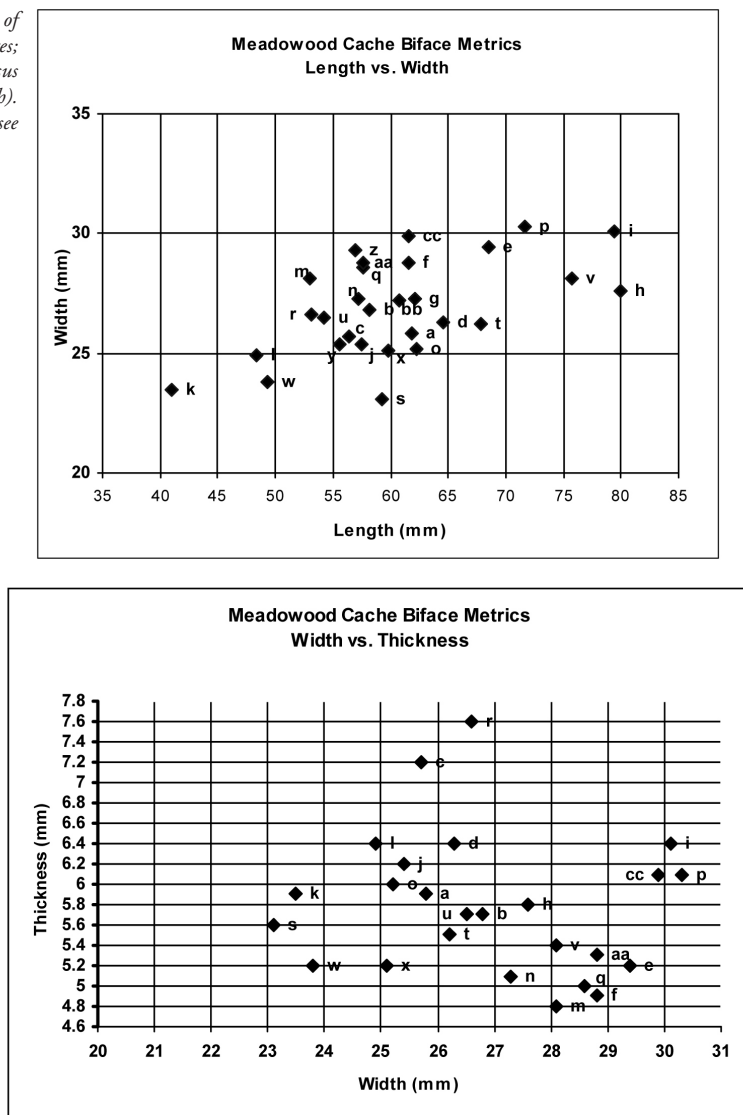


tion. One specimen exhibits two shallow notches while another fragment, perhaps snapped in manufacture, was retouched.

These bifaces are much smaller in size than those in Cache 1. The average length of the analyzable specimens is 61.2 mm with a range of 39.1 mm-83.2 mm. The mean width is 29.9 mm with a range from 21.4 to 38.4 mm, and the average thickness is 6.1 mm with a range of 4.5 to 7.8 mm.

Figure 3 illustrates the average length/width and width/thickness ratios for 29 Onondaga chert biface caches in the Northeast (Tables 2 and 3). Meadowood-like caches have been found in more distant locales although these were made from local cherts suggesting that it was caching behaviour rather than the exchange of items made from Onondaga chert that was the essential social act (e.g. McEachen 1996). In terms of length, the only bifaces that closely resemble the

**Figure 3.** Biface cache ratios of length versus width (averages; upper graph) and width versus thickness (averages; lower graph). For key to site cache names, see Table 3.



**Table 2.** *Northeastern Meadowood biface cache sites.*

Site Name	Bifaces (n)	Other Items	Debitage	Site Context	Feature	Reference
Ontario						
Barber	11			burial site	cremation burial	Fox 1984
Boyd – F25	17	9 side-notched points, 2 drills, ground stone fragment, gorgets	no	burial site	offering	Spence et al.1978
Cashbrown	30	scraper	no	isolated cache	cache	Williamson 1988
Hoover						Fox 1984
Liahn II	37	no	no	burial site	cache	Williamson 1980
Moerschfelder						Fox 1984
Nanticoke						Williamson 1988
Peace Bridge 1	30	no	yes	quarry	cache	Williamson and MacDonald 1997
Peace Bridge 2	38	no	no	quarry	cache	Williamson et al. 2006
Theford	166	no	no	isolated cache; riverbank	cache	Ritchie 1955
New York						
Buffalo G	18		no	isolated cache	cache	Granger 1981
Hunter						Ritchie 1955
Irondequoit Creek	100		no	isolated cache; creekside	cache	Ritchie 1955; Granger 1981
Macauley Complex						Granger 1981
Morrow	~ 40		no	burial	burial	Ritchie 1965
Muskalonge Lake	~1500	hammerstone, adze, copper celt, copper bead, gorget	no	burial	burial	Ritchie 1955
Nahrwold II						Granger 1981
Nine Mile Swamp	40, 19	no	no	habitation	cache	Granger 1981
Oberlander II	28, 44, 78	yes	no	burial site	burials	Ritchie 1944, 1955
Rene Menard Bridge II	81		no			Granger 1981
Riverhaven II, F3	21	yes	yes	habitation	manufacture	Granger 1978
Scaccia						Granger 1981
Sinking Ponds						Granger 1981
Vinette						Granger 1981
Quebec						
Lambert	180	n/a	no	habitation	burial	Chretien 1995
Pointe du Buisson 4	27	yes	no	habitation	cache	Clermont and Chapdelaine 1982
Pointe du Buisson 5						Clermont 1978
Connecticut						
Seward	31	n/a	n/a	isolated cache	disturbed context	Granger 1981
Smith Brook	499	n/a	no	isolated; river-bank	cache	R. Q. Bourn 1966

**Table 3.** Average length, width and thickness for Meadowood Biface caches.

Meadowood Cache Biface Metrics (averages)				
Site Label	Name	Length (mm)	Width (mm)	Thickness (mm)
a	Moerschfelder	61.9	25.8	5.9
b	Cashbrown	58.1	26.8	5.7
c	Bruce Boyd	56.4	25.7	7.2
d	Barber	64.5	26.3	6.4
e	Liahn	68.5	29.4	5.2
f	Thedford	61.5	28.8	4.9
g	Hoover	62.1	27.3	—
h	Nanticoke	80.0	27.6	5.8
i	Peace Bridge Cache 1	79.4	30.1	6.4
j	Sinking Ponds	57.5	25.4	6.2
k	Riverhaven II	41.0	23.5	5.9
l	Scaccia	48.4	24.9	6.4
m	Morrow	53.0	28.1	4.8
n	Oberlander II	57.2	27.3	5.1
o	Buffalo G	62.3	25.2	6.0
p	Muskalonge Lake	71.7	30.3	6.1
q	Hunter	57.6	28.6	5.0
r	Nahrwold II	53.1	26.6	7.6
s	Vinette	59.3	23.1	5.6
t	Irondequoit Bay	67.8	26.2	5.5
u	Rene Menard	54.2	26.5	5.7
v	Seward	75.7	28.1	5.4
w	Nine Mile Swamp	49.3	23.8	5.2
x	Macauley Complex	59.8	25.1	5.2
y	Smith Brook	55.6	25.4	—
z	Pointe du Buisson 4	57.0	29.3	—
aa	Pointe du Buisson 5	57.6	28.8	5.3
bb	Lambert/St. Nicolas	60.7	27.2	—
cc	Peace Bridge Cache 2	61.6	29.9	6.1

Peace Bridge cache are from the Nanticoke site in the nearby Haldimand-Norfolk region (Williamson 1988) and those from the Tozer site in New Brunswick (Allen 1982; McEachen 1996). In terms of width, the bifaces from the Liahn II site near Lake St. Clair (Williamson 1980) are similar as well as the assemblage from Pointe-du-Buisson 4 (Clermont and Chapdelaine 1982) and Muskalonge Lake (Granger 1981). In thickness, the Meadowood bifaces from the

Barber and Bruce Boyd sites are similar as are those from the Nahrwold 2 and Tozer sites.

The greater size of the Peace Bridge Cache 1 and Nanticoke site bifaces may simply be a reflection of the availability of raw material at these two chert quarry sites and the fact that they are from manufacturing contexts, as the presence of debitage in the Peace Bridge Cache 1 indicates. In most other cases, for ease of mobility, groups may have refined bifaces into finished

tool performs, requiring only a minimal amount of time and effort for transformation into projectile points, knives, scrapers and drills (Granger 1981). Some bifacial preforms, however, may have been carefully curated until they were cached permanently in burials or isolated features. On the other hand, the cache with the shortest and one of the narrowest average biface sizes was Riverhaven, found in a feature context interpreted by Granger (1978a) to have also been a biface preparation site, although at some distance from an actual quarry. While the knapper in this and related cases may simply have been starting with smaller blanks, the width data suggest there was a maximum threshold of about 30 mm, indicating that the width of the original blanks for all of these bifaces generally limited their final form. On the other hand, the main trend indicated by the width versus thickness ratios points to an inverse relationship between thickness and width — the wider the biface the thinner the biface — also a reflection of knapper skill.

While the main difference between the two Peace Bridge cached bifaces appears to have been one in length, it is also possible that Cache 2 was related to a different kind of ceremony than Cache 1, given the presence of red ochre in the feature. In both cases, broken and used tools were included in the caches, as they were in other sites (Williamson 1980, 1988). It appears that even in caches that were unlikely to be relocated, and thus intended as permanent offerings, used tools may have had as much symbolic significance as unused ones.

Granger (1978b) has argued that Meadowood trade networks primarily functioned on an economic level. He did suggest, however, that it was the trade network that led to the “core of religiosity” and that local circumstances led to local decisions regarding the size of the economic surpluses to be retired at socially integrating ceremonies. Such an explanation was thought to account for the wide variance in the frequency of 10-1500 bifaces per cache. Meadowood bifaces have also been viewed as a kind of “peace fare” for maintaining exchange systems for the bands outside of the core area. While it is now clear that cached

bifaces represent more than simply mortuary items, as was originally thought by Ritchie (1980), their explanation as stored, surplus preforms from which a variety of tools could be produced (Granger 1978b, Snow 1980), is also inadequate in and of itself given the range and complexity of their cultural contexts and their frequency in the archaeological record. There seem to be too many for all to be explained away as simply unretrieved utilitarian stockpiles. Some Adena Early Woodland deposits are definitively offerings as they were placed in bogs and clearly intended to be forever inaccessible as were of course, those Meadowood caches associated with burials reported from several sites (e.g. Spence et al. 1978; Williamson 1980). The implication of these data is that the production systems and exchange networks may not have been simply about economic transactions. Simply, like many artifacts, these Onondaga bifaces were used in both sacred and secular circumstances and their final deposition in one context does not preclude their having been used previously in others (Williamson 1996).

It is conceivable, for example, that there was a long-standing tradition of ceremonial behaviours, on the part of knappers, or individual hunters who relied on stone for their weapons and hunting tools, that at times required a refocusing of the object’s value in the sacred realm, itself a reinforcement of the basic philosophical tenet of aboriginal worldview (Williamson 1996). This might explain the caching of pristine or used items in quarry, habitation, ceremonial and isolated contexts.

## Ground and Rough Stone

### *Netsinkers*

The presence of large numbers of netsinkers across the site, many of which came from features that also yielded Meadowood diagnostics, underscores the importance of the Niagara River fishery. Netsinkers were likely used as drogue anchors to weigh down the bottom of gill nets and also may have been used on seine nets (Cleland 1982). Given the riverine location of the site and

the presence of former shallow embayments at the Niagara River mouth, gill nets could easily have been set by canoe or simply wading out into the river. This would permit the easy capture of exceedingly large quantities of fish, especially during the spring spawning runs.

Netsinkers have been identified in the lower Great Lakes as early as the Middle Archaic (Ritchie 1980; Ellis et al. 1990) and appear to have been used continuously well into the seventeenth century. Indeed, at the original Orchid excavation, netsinkers likely attached to a gill net, were associated with a seventeenth century Neutral burial (Granger 1976). The placement of nets in burials appears to be a practice dating back to the Early Woodland period as attested to a net found at the Meadowood Morrow cemetery in New York State. This remarkable find consisted of a rolled net with attached netsinkers that had been cremated, resulting in the preservation of portions of a hemp twine gill net (Ritchie 1980:186-188).

Netsinkers were the most common ground or rough stone tool recovered from the Peace Bridge site. In the 1992 to 2003 excavations, 459 complete, 350 fragmentary specimens, and 59 notch spalls were found. The vast majority of net sinkers were made from flat sandstone cobbles which had notches created in the centre of their longest lateral margins by percussion flaking. The items interpreted as netsinker notch spalls are flakes of (usually) sandstone that exhibit uniform characteristics consistent with such a process of notch formation and indicate manufacture on site. Measurements for a sample of complete netsinkers ( $n=73$ ), recovered from the 1994-1996 excavations (MacDonald et al. 1997: 372-375), range in length from 36 to 179 mm (mean= $107.8 \pm 27.5$  mm), from 34 to 136 mm in width (mean= $80.0 \pm 20.0$  mm), and from 8 to 34 mm in thickness (mean= $17.0 \pm 5.3$  mm). Over 25% of netsinkers recovered from the site are stained with red ochre, which was used by Late Archaic Genesee, Meadowood and Transitional Woodland populations on the site, especially in burial contexts.

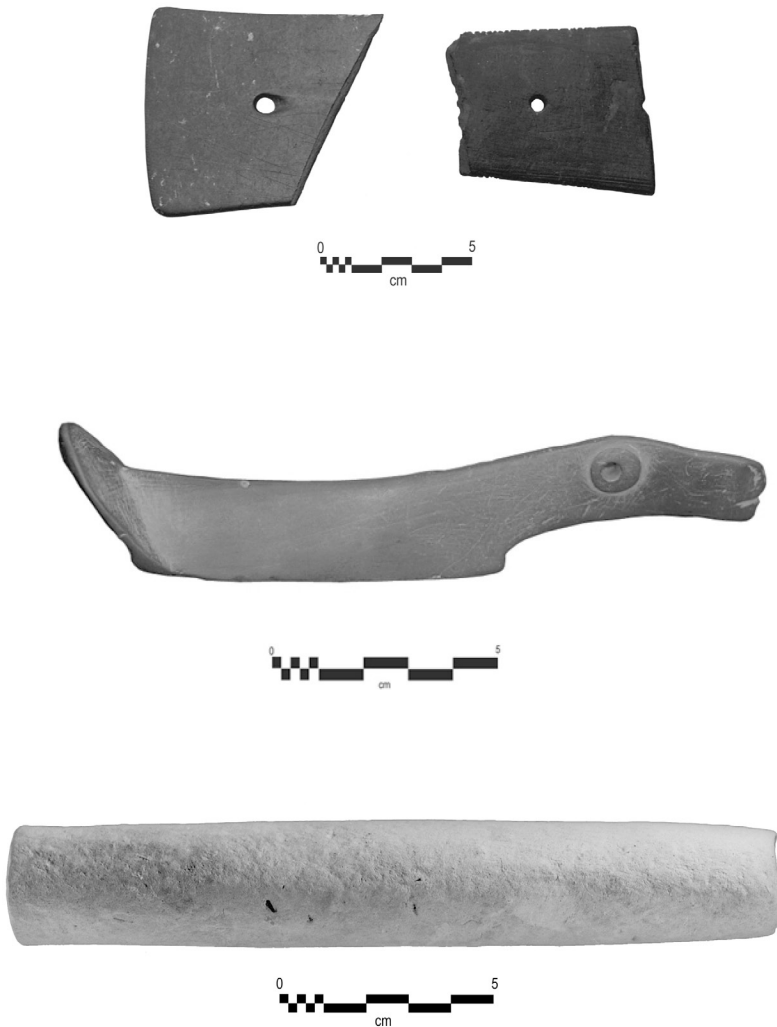
#### *Trapezoidal Gorget*

A portion of a trapezoidal gorget manufactured from reddish slate was recovered from an area of undisturbed palaeosol under the road at the intersection of Niagara Boulevard and Queen Street. Such artifacts are usually referred to as trapezoidal as they are characterized by distinct concave sides and convex ends. They are considered distinctive of the Meadowood complex (Spence et al. 1990:129).

This specimen had suffered an oblique, transverse break, such that only one end was recovered, likely representing about half of the artifact (Figure 4a). It measures 74.8 mm in length, 69.2 mm in maximum width, and is 6 mm thick. Near the centre is a drilled hole that exhibits suspension wear. The end of the specimen is decorated with fine, closely spaced incisions at about 1 mm intervals that are cut into the top edge such that they are visible on both the edge and obverse face. Similar incisions, although heavier and more widely spaced, appear on the lateral edges. The reverse face is less well polished and exhibits a slight channel about 28 mm wide running longitudinally down the centre, suggesting the piece may not have been worn by an individual but had been lashed to another object.

A second gorget, which was recovered from one of the twelve one-metre square units excavated within the entranceway to the Riverwalk Trail for the Town of Fort Erie on the south side of Niagara Boulevard across from the T-intersection with Forsythe Street, consists of a mid-section manufactured from a brown colored slate (Figure 4b). It is broken at both ends in the area of a bi-directional perforation. There is a third bi-directional perforation located in the centre of the artifact. There are small notches located along its lateral margins. While the purposes of the notches, whether functional or decorative, are unknown, they appear to be common on Early Woodland gorgets. One surface exhibits parallel scratches running perpendicular to the item's axis, while the opposite surface has parallel lines near the edge extending parallel to the axis. These lines may represent the stone's natural striae exposed by slight beveling of the

**Figure 4.** Trapezoidal gorgets, birdstone and blocked end tubular pipe recovered from the Peace Bridge site.



edge. It measures 60.8 mm in length in mid-section, 54.5 mm in maximum width and 7.0 mm in width.

A third possible gorget, made of black slate, was found in another nearby Meadowood feature along with 26 diagnostic lithic tools and an almost complete ceramic vessel. It appears to be unfinished except for one smoothed lateral margin. It measures 54.2 mm in length, 51.5 mm in width and 4.3 mm in thickness.

#### *Birdstone*

A unit measuring 3.5 by 3.0 metres was excavated in advance of the installation of a hydro pole and adjacent anchor, immediately north of the former Walnut Street allowance between Goderich and Archange Streets, about 20 metres north of the Cache 2. The soil stratigraphy of the unit revealed 25–40 cm of granular fill; 5–25 cm of grey clay containing twentieth century material; 24–60 cm of dark brown sandy soil containing both Onondaga chert flakes and twentieth century fill; and 40–80 cm of orange-yellow

sand subsoil overlying bedrock. Four pre-contact aboriginal features were visible at the level of the subsoil. Feature 1, a large, organically rich, shallow and flat-bottomed pit, perhaps a deposit of remnant palaeosol, contained debitage, a netsinker, and an Early Woodland birdstone. This rare artifact depicts a swimming bird and may have functioned as a counterweight at the end of a spear thrower or atlatl (Figure 4). It is made of a purple-brown colored slate and measures 149.8 mm in length, 24. mm in width, and 28.2 mm in height. It has an elongated head, neck and body with a fan shaped tail. Perforations are located at both ends of the flat base and extend on an angle through to the base of the tail in the rear and just below the neck in the front. Both perforations are bi-directional. While the base is smooth and has parallel scratches on either side of the perforation there is little wear from lashing. Fine scratches are observable in the area of the tail and may be either decorative or related to finishing.

The eyes of the birdstone are unusual and consist of raised ovals that have been perforated bi-directionally through the head. On one side of the head the raised oval eye has been broken or ground off. Perhaps the most unusual feature of this artifact is a notched mouth at the end of the head.

The three surrounding features contained a red ochre stained netsinker fragment and a small quantity of animal bone, none of which was human.

#### *Blocked-end Stone Tube Pipe*

A blocked-end stone tube pipe made from limestone was found adjacent to the left humerus of a tightly flexed primary inhumation of an adult, who had been placed directly on bedrock only a few metres from the shoreline. The pipe was reburied with the individual. The pipe stone was a light grey, non-local limestone containing a small non-charred, dark grey, faceted pebble measuring 1.7 cm by 1.33 cm by 1.14 cm (Figure 4). The length of the pipe was 18.6 cm and its width midway 3.16 cm. It measured 2.9 cm in diameter at the small-holed end and 2.71 cm at the large-holed end. The diameter of the bore-

hole was 1 cm at the small, tapered end and 2.26 cm at the large end. The surface of the small end was asymmetrically ground while the edges on the large end were rounded and ground. The surface of the pipe was ground but not smoothed or burnished and no etchings were noted on either interior or exterior surfaces. Drill striations, however, were obvious for several centimetres inward from the small-holed end while the larger end exhibited interior parallel striations. Pipes similar to these have not been reported from Meadowood contexts and they are usually assigned to Middlesex/Adena sites of 2500 to 2200 BP (Spence et al. 1990:138).

### **Ceramics**

All ceramic sherds that have been recovered from the site have been subjected to detailed examination involving sorting by vessels wherever possible. The diagnostic traits used to define Early Woodland pottery in the Northeast were established nearly fifty years ago (Ritchie and MacNeish 1949) and have changed very little in the intervening years (Granger 1978a; Jackson 1980, 1986; Spence and Fox 1986; Spence et al. 1990). Originally defined as a type within the Point Peninsula pottery series, Vinette 1 ware was described as a thick, coarse-tempered, poorly made, coil-constructed pottery with interior-exterior cord-marking and no evidence of decoration. Vessels had straight and slightly outsloping profiles that gradually thinned towards mostly rounded lips, straight and elongated bodies, and conical bases (Ritchie and MacNeish 1949:100). Over the past three decades, a series of variants have been discovered on Early Woodland sites in Ontario, including smoothed over interior and/or exterior cord-marked surfaces, exterior punctates added as decoration, finer twisted cords wrapped on the paddles, and vessels built with thinner walls and fine-tempered, better knit and fired pastes (Granger 1978a; Jackson 1980, 1986; Kenyon 1979; Spence et al. 1978; Spence and Fox 1986; Williamson and Pihl 2002). These refinements have been attributed to a developing regionalism that was later reflected in the various

Middle Woodland wares (Spence et al. 1990:137). Detailed published descriptive data are available for the various Early Woodland vessels identified from the 1994-1996 sample of more than 3000 sherds, most of which fall within the classic Vinette 1 ware definition discussed above (Pihl 1997:Table 8.14, Figures 8.25 and 8.26; Plate 8.30) (Figure 5).

These vessels have a slightly gritty to gritty texture, fine to medium-sized grit temper, and either poorly or rather well knit and fired paste. Surface treatment is predictably cord-marked on the interior and exterior, but many surfaces are smoothed, including most of the lips. The preferred paddling is either to the left or right, but overlapped paddling was noted in two cases. The vessels have relatively straight necks with slightly insloping rims which taper from thick bodies averaging 17.6 mm thick (n=2; range 11.6-23.5 mm) to flat lips averaging 8.1 mm thick (n=9; range 6.0-9.7 mm). Neck or upper rim thickness, the latter measured 25 mm below the lip, averages 8.3 mm (n=5; range 7.4-9.4 mm). A single sub-conical base was recovered, and it measures 27.1 mm thick. Only one coil break was observed on a body sherd, suggesting that the coils were extremely well fused.

While most of the vessels are undecorated, one had at least one vertical trailed line on its interior cord-marked surface, although it may have been surface treatment and not decoration.

Another vessel is atypical with a smooth texture with medium to coarse grit temper and was relatively poorly knit and fired. It has a smoothed interior surface (and finger anvil marks), but the exterior shows traces of cord-marking which has been heavily smoothed or wiped, and encrusted with carbon. The vessel has a vertical to slightly insloping rim with a flat to rounded lip, and varies in thickness from 6.3 mm at the lip to 8.2 mm near the shoulder area. Although exterior decoration is absent, the vessel interior and lip are embellished with widely spaced trailed lines. The vessel was assigned to the Early Woodland period by virtue of its paste and vessel shape.

Although only a small sample of Vinette 1 ceramics has been identified in subsequent excavations at the site, there are a few noteworthy

examples including an unusual rim, which resembles Vinette 1 ware in terms of paste, surface treatment and vessel profile, but features exterior decoration consisting of right oblique trailed lines. Since it comes from a context that yielded at least one other typical Early Woodland rim, this specimen likely represents a rare, decorated Vinette 1 variant. A vessel rim with smoothed exterior and interior surfaces but otherwise similar vessel characteristics was also recovered.

Twenty-seven basal sherds were identified within the total sample, and these represent rounded and semi-conoidal- and conoidal-shaped vessels. Although, many feature cord-marked interiors, these cannot be assigned unequivocally to the Early Woodland period. Research at other sites in southwestern Ontario such as the Holmedale site in Brantford (Pihl 1999) is now demonstrating that this cord-marked interior surface treatment re-surfaces during the Transitional Woodland period. Interior cord-marking (whether smoothed-over or not) cannot automatically be considered diagnostic of the Early Woodland period.

In summary, based on the limited and largely fragmented sample, the Early Woodland pottery from the site might be considered relatively well made but typically crude in appearance. The rare use of trailed lines on the vessel interior (and lip) is perhaps a local trait. Likewise, the appearance of a smoothed interior surface on an otherwise Early Woodland vessel might be considered a noteworthy albeit isolated departure from typical Vinette ware.

### Settlement and Subsistence Patterns

Unfortunately, it is common at the site to find features containing a wide temporal range of diagnostic stone tools and/or ceramics. In one case, a feature was found to contain Genesee and Meadowood material along with walnut shell, which was radiocarbon dated. While the shell was tested to secure a date for either the Genesee or Early Woodland component, the walnut dated to the thirteenth century, providing an accurate assessment of the occupation of an Early





**Figure 5.** Selected Vinette 1 ceramic vessels from the Peace Bridge site. Undecorated vessels with cord-marked exteriors and interiors (a, b, d, f, g, j, k, and l); vessel with smoothed exterior and interior surfaces (e); vessels with smoothed over cord-marked exterior surfaces and trailed oblique or vertical decoration (c and h); variant vessel with smoothed over corded exterior and trailed oblique interior decoration (i); and reconstructed conoidal base (m).

Iroquoian house structure nearby (Robertson et al. 1997:504). The following discussion was mindful of this phenomenon and includes only those features that yielded predominantly and at the latest, Early Woodland materials. It is important to note that the palaeosol above these features was almost always screened and found to contain materials dating from Late Archaic through Transitional Woodland times.

One of the areas of concentration of Meadowood occupation is near the intersection of Niagara Boulevard and Forsythe Street, adjacent to the former Orchid component (Figure 6). Not only is this one of the richest zones of the site in terms of artifact density but it also has yielded evidence of numerous features filled with faunal material. In 1994, for example, a trench was excavated under the modern road surface of Niagara Boulevard, within which were documented nine pre-contact features as well as several post moulds. One of these features was a large, basin-profiled pit with dark organic fill which had been disturbed on the west side by modern trenching and completely truncated on the north by additional trenching. It produced a drill base of undetermined age, four bifaces (one complete, three partial), a netsinker fragment and two netsinker notch spalls, and five fragmentary sherds of cord-marked pottery. On removal of it and the disturbed fill to the west of it, the base of another pit, Feature 2, was revealed. This feature was found to contain the base of a Vinette 1 vessel, the top of which had been sheared off by the installation of a gas pipe. As well as Late Archaic diagnostics, it also yielded a Meadowood biface base, a number of non-diagnostic bifaces, three netsinker fragments and thirteen netsinker notch spalls, and fragments of cord-marked pottery. The faunal remains recovered from the feature include 118 mammal fragments (proximal and distal appendicular deer, a raccoon canine, a dog canine, a bear canine, chipmunk, grey squirrel, and muskrat); eight fragments of a large bird; and 255 fish elements, the majority of which are attributable to the genus *Stizostedion* (pickerel/sauger) although sturgeon, channel catfish, sucker, and bass remains were also recovered (Thomas 1997:441-451). In terms of plant remains

(Monckton 1997:427-440), 1.5 g of hickory nut, 0.9 g walnut, one black nightshade seed, and one cleavers seed were recovered from a flotation sample. The fruit of black nightshade is toxic unless processed in soups, and was likely harvested ripe in the fall if it was used for food, although it may have had other uses given its hallucinogenic properties in an unprocessed format. Cleavers, a green, is widely represented in north-eastern North American archaeological contexts (Yarnell 1993).

Approximately half of another feature (Feature 6) was exposed along the south edge of the trench. It produced the base of a Genesee point, the base of an Innes point, one complete Meadowood preform, the mid-section of an unidentified projectile point, eight complete and seventeen partial bifaces, two complete and one partial netsinkers, and fifty-seven ceramic vessel sherds, including rim fragments from two Early Woodland vessels. The faunal remains included 38 mammal fragments (distal appendicular deer, a possible elk incisor, grey squirrel, fisher); four Blanding's turtle fragments; and 136 fish remains, again mainly *Stizostedion*, but also sturgeon, drum, and large redhorse (Thomas 1997:441-451).

Features 2 and 6 both contained Meadowood lithics as well as Early Woodland ceramics, but apparently no later material, so an Early Woodland age for these pits seems very likely. This is particularly true for Feature 2, since it is unlikely that a more or less intact Vinette 1 vessel would become mixed into the fill of a later pit.

Excavations in adjacent trenches, just to the west under Forsythe Street in 2001 through 2004, yielded similar evidence for Meadowood occupation. One feature (Feature 6) was an incompletely exposed Early Woodland Meadowood pit measuring 215 cm in length, 114 cm in width and 68 cm in depth. The profile shape was irregular and a concentration of ceramics was observed near the base of the pit. The soil fill was comprised of dark brown sand mottled with subsoil. Among the artifacts recovered from the feature were numerous complete and fragmentary Early Woodland Meadowood period bifaces and projectile points (n=21) as well as two drills, two perforators, one scraper, 76 non-diag-

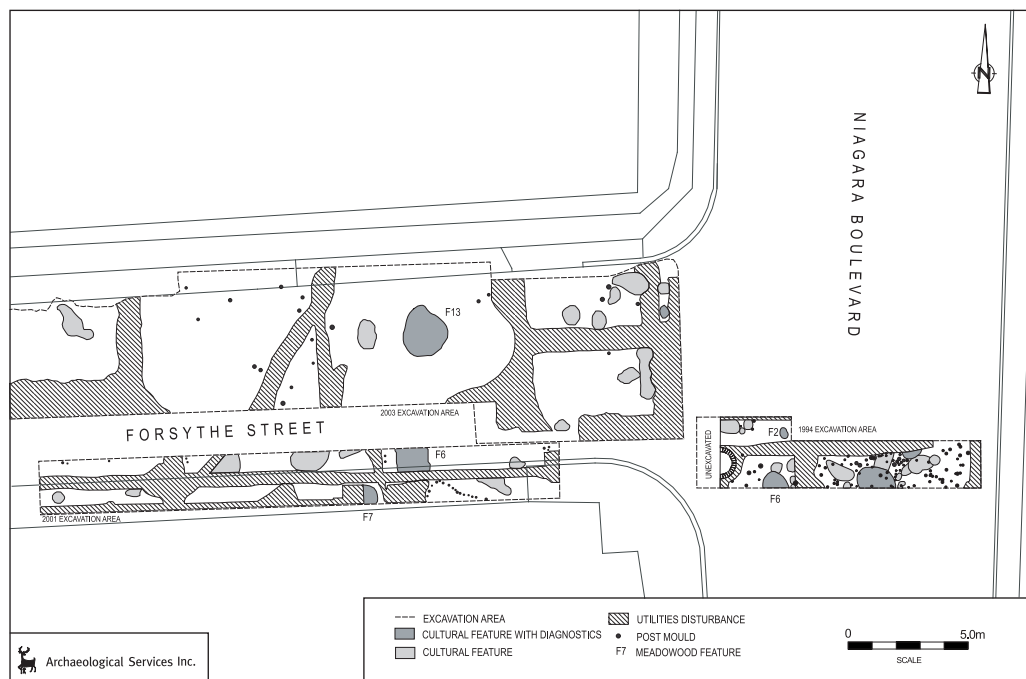


Figure 6. Settlement patterns in the vicinity of Forsythe Street and Niagara Boulevard within the Peace Bridge site.

nostic Onondaga chert bifaces (24 complete, 52 fragmentary), one abrader, one celt, a fragment of a slate gorget, one grooved stone, four hammerstones, three netsinkers, one bone awl, and a worked bone fragment. In addition, 208 pre-contact ceramic sherds were recovered from this feature, of which 44 have been mended together to form a nearly complete Early Woodland vessel (Figure 5m). Six hundred and three faunal fragments were recovered from this feature: 331 mammal, 212 fish, 15 bird, one reptile, and 44 unknown. Of the 602 specimens, 170 or 28.0% of the sample were identified to lower zoological taxa (Stanchly 2004:20-25).

Mammals account for 331 specimens or 54.9% of the feature sample. The majority of the unidentified mammal bone is of medium to large sized species. Seven species were identified including white-tailed deer and possibly elk, accounting for 36.6% of all identified mammal specimens. Only one deer is likely represented by the identified remains. One fragment is a beam portion, on which several cut and hack marks are present, consistent with antler tine removal. Other mammals include raccoon, representing 29.6% of identified specimens, two immature

grey squirrels, two cranial fragments of beaver, nine elements of a probable single domestic dog, and a black bear scapular fragment.

A total of 96 fish elements representing a minimum of 15 fish have been identified and include representatives of at least five species. No attempt was made to identify fish vertebrae.

Seventy-eight elements were identified as *Stizostedion* sp. Although walleye and sauger have very similar cranial elements, most of the identified *Stizostedion* bones are probably those of walleye, based on size. A minimum of 10 walleye is present within this feature based on the total of left dentaries. One other element could not be positively identified beyond the family level of Percidae, although the element is from either a very small walleye, sauger, or a yellow perch. Two elements of freshwater drum, one white sucker operculum, four cranial fragments of lake sturgeon, two elements of channel catfish and one dentary bone of a lake trout were identified. Seven further elements, mostly pectoral fin spines, are identified only as belonging to a catfish species or family member.

A total of 15 bird bones was recovered, only three of which could be identified as wild turkey.

The remaining 12 specimens include four to five large bird specimens that may also be wild turkey. A small to medium sized bird is also present, possibly passenger pigeon. Unfortunately these are highly fragmented and are not considered identifiable.

One element of snapping turtle, a fragment of a costal bone from the upper shell or carapace, was also identified.

Only two worked bones were found within the faunal sample. Both were recovered from Feature 6. This includes one complete awl made from a large mammal long bone, possibly a deer metapodial. The total length of the awl is 10.4 cm. The other worked bone from Feature 6 is an incomplete long bone fragment exhibiting polishing on one end over the surface of a pre-existing spiral fracture.

Another nearby feature (Feature 7) is a possible Early Woodland refuse pit. It had a round plan view and a deep basin profile. It measured 120 cm in length, 85 cm in width and 60 cm in depth. The soil fill was a medium brown sandy loam mottled with subsoil. The feature contained four Early Woodland Meadowood period projectile points and two bifaces, two Early Woodland Meadowood period drills, one scraper, 19 Onondaga chert bifaces (eight complete, 11 fragmentary), ten ground stone tools (four hammerstones, five netsinkers, one red ochre stained stone), along with 28 pre-contact ceramic sherds. A sample of debitage was collected from this feature, which yielded five primary reduction flakes, 13 primary thinning flakes, 43 secondary knapping flakes, 32 secondary retouch flakes and 78 flake fragments (shatter). Retouch/utilization is evident on one primary thinning flake and two secondary knapping flakes, and 14 pieces of debitage had been thermally altered.

The faunal assemblage recovered from this feature includes 191 specimens: 92 mammal, 72 bird, 11 fish, three reptile, and 13 unidentifiable (Stanchly 2004:25-27). Of the 191 specimens, 61 pieces or 32.0% of the sample were identified to lower zoological taxa.

Mammals account for 92 or 48.2% of the sample. Of these, 20 have been identified to lower zoological taxon and include thirteen deer

bones, representing a minimum of one deer (one tine fragment with cut marks and at least a few elements in the wapiti size). Three dog elements, a portion of an immature raccoon hip bone, grey squirrel long bone fragments, one of which is a tibia of an immature individual, and one rodent incisor, possibly a beaver although the fragment is too small for a positive identification, were also recovered.

Fish account for 72 or 38% of the faunal sample. Of these, 33 have been identified to lower zoological taxon and include walleye/sauger (6 fish/29 elements), one fragment of a white sucker operculum, one cranial fragment of a lake sturgeon, a right maxilla of a burbot, and a partial pectoral fin spine of a probable channel catfish.

In an immediately adjacent trench, another Early Woodland refuse feature was found, Feature 13, measuring 242 cm in length, 232 cm in width and 68 cm in depth. It had a basin profile shape characterized by two layers, the top one of which consisted of homogeneous dark brown to black sand, while the second layer consisted of dark sand mottled with orange-yellow sand and fired soil with inclusions of charcoal flecks, fish bone and pea gravel. While the top layer was sterile, the lower layer yielded Vinette 1 ceramics, as well as 349 lithic artifacts including two Meadowood projectile points, 11 Meadowood biface bases, one scraper made of Upper Mercer chert, and two Meadowood drills. A flotation sample was collected from the feature and yielded three hickory nutshells, one acorn nutshell, eight pieces of unidentified nutmeat, one piece of unidentified organic material, two fragments of maple wood, two pieces of beech, 13 ash fragments, four pieces of elm, one fragment of oak, and 12 pieces of unidentified wood (seven from deciduous species and five from unidentified species) (Monckton 2005). No seeds were recovered. The recovered faunal remains included 58 *Stizostedion* sp. (pickereel/sauger) bones, two catfish, 29 probable deer bones, one grey squirrel, and 213 unidentified mammal bone, the vast majority of which was large in size (Needs-Howarth 2005:56).

### Discussion

All of the faunal material from these Meadowood features on this portion of the site suggest spring and fall procurement of locally available species as the identified mammal, bird, and reptile species would have been available within the Fort Erie area. The presence of all body portions of deer suggests that deer was processed within the site area.

Fishing, however, seems to have been the primary economic pursuit reflected in these features, with particular emphasis on the exploitation of walleye/sauger. Their large numbers suggest a spring or early summer occupation when these fish would have been spawning. The presence of juvenile and immature mammals also points to a spring occupation.

The rarity of salmonids (e.g. lake whitefish, lake herring, and lake trout) is noteworthy and perhaps indicative of the absence of a fishery targeting fall-spawning species. There were also few perch and no ictalurids in the brown bullhead size range. Very few sunfish (*Ambloplites*, *Lepomis*, and *Pomoxis* sp.) were noted. Perch, bullhead, and sunfish are commonly found in many pre-contact assemblages as a result of the fishing of the shallows of creeks, rivers and small lakes. Together with the emphasis on *Stizostedion*, these data suggests a fishery oriented towards selective exploitation of the resources of Lake Erie (including the uppermost Niagara River) rather than fish found in its surrounding wetlands or in its tributary streams and rivers. The generally large size of the drum and channel catfish, together with the dearth of evidence for fish hooks or gorges and the presence of considerable numbers of netsinkers, suggest net fishing rather than angling as the procurement method (Thomas 1997: 441-492; Stanchly 2004:29).

### Burials

Twenty-two of the roughly 700 features excavated during major infrastructure projects carried out between 1994 and 2002 (ASI 2004a, 2004b, 2004c, 2005; Austin et al. 2006, Williamson and MacDonald 1997, 1998) represent burial

deposits. A small number of these likely represent Transitional Woodland interments, but given the extent of the Genesee and Meadowood occupations at the site, many possibly represent the burial places for Late Archaic and Early Woodland individuals.

One complete primary inhumation is definitively Early Woodland. It was partially documented in a very shallow grave measuring 160 cm in length by 80 cm in width. The individual was placed on their right side in a tightly flexed position with their head to the south facing east. The individual had been placed directly on the bedrock only a few metres from the shoreline and the skeletal elements were in a very deteriorated and fragile state. The molars and premolars were extremely ground to the point of exposure of dentin. No sexing, aging or other observations were possible. Clearly, however, from the nature of the teeth and the size of the pelvis and long-bones, the individual was an adult. The blocked-end stone tube pipe made from limestone described above was found adjacent to the left humerus of the individual and indicates a late Early Woodland Middlesex/Adena affiliation of this interment. Found below the arm and pipe was a complete, finely-made T-shaped drill manufactured from Onondaga chert. It measured 7.54 cm long while the base was 2.3 cm wide. Both objects were re-interred with the skeletal remains as they were clearly grave goods. As there was no need to further disturb the burial, it was covered with sand and filter cloth and reburied as part of the resurfacing process in the Peace Bridge truck yard.

In the central sector of the site, nine features documented 20-40 metres to the south of the biface caches contained skeletal material, often accompanied by red ochre. Several others occurred to the northeast near the intersection of Queen and Niagara Boulevard. While some of the features adjacent to these burials contained single Meadowood artifacts, there is no direct evidence of the cultural affiliation of the remains in the form of accompanying grave goods that are attributable only to one time period. The burial protocol negotiated with First Nations for the site, wherein confirmed burials were not further

excavated, but preserved through project redesign, has somewhat hampered our ability to conclusively establish their association.

In the absence of diagnostic artifacts, other attributes, such as the use of red ochre, are only of limited help. Red ochre is commonly found in Meadowood mortuary and ritual contexts (e.g. Williamson 1980), but is not restricted to them. It was used on earlier Glacial Kame sites such as Hind (Donaldson and Wortner 1995), and likely by the Genesee occupants at Peace Bridge as well. At least three burials encountered during the 1994-1996 work may represent Genesee cremation burials, in which case they would represent the first finds of Broad Point tradition burials in Ontario; a (Perkiomen) cremation burial was found at the Piffard site in New York (Ritchie 1980:154). In terms of their overall form and character, these cremations are closely comparable with the Late Archaic "Susquehanna" mortuary complex of the Mid-Atlantic coastal region (Dincauze 1968; Borque 1976; Snow 1980:242-243; Leveille 1996), in that they are represented by deep basin pits, the fills of which consist of basal layers of fired soil and/or highly organic, greasy black soils. Red ochre was also found to accompany some of the cremations. The cremated material may occur both as discrete pockets near the base of the feature, or may be more broadly scattered throughout the feature. Like the burials of the Mid-Atlantic, tools or preforms, which are often broken or burnt, and substantial quantities of burnt and unburnt animal bone accompany some of the Peace Bridge cremations. Ochre was also used as a burial treatment during the Middle-to-Late Woodland transition, as seen on the Peace Bridge site at the Orchid component (Granger 1976) and in other locales examined more recently.

Documented Meadowood cemeteries, such as Liahn 2 (Williamson 1980), Bruce Boyd (Spence et al. 1978), Pointe-du-Buisson (Clermont 1978, Clermont and Chapdelaine 1982), and the Indian River sites in New York (Ritchie 1955:21, 25-26) tend to be somewhat removed from their associated occupation areas, but it is unclear if this pattern, strictly speaking, holds at the Peace Bridge site. Given the scale of the Meadowood

occupations, as gauged by the relative volume of diagnostic material that has been recovered, and its distribution across the entire site, albeit with some variations in density, any such separation between habitation areas and cemetery areas is blurred; even more so because of the likelihood that subsequent occupations have also had their effects. Excavations carried out south and southwest of the bridge structure between 1997 and 2000 resulted in the recovery of many items that had been treated with red ochre. These were mostly recovered from palaeosol contexts, distributed over a wide area, and include almost 40% of the assemblage of over 300 netsinkers, 20% of the assemblage of 235 hammer stones, 44 otherwise unmodified fist sized stones and a small number of bifaces. It is possible that these items represent the remains of shallow burial features that have been disturbed by precontact and historic activities and dispersed over wide areas.

### Conclusions

The vast quantities of chert tools and debitage that have been recovered from the site, and the fact that diagnostic materials of the Late Archaic as well as Early and Transitional Woodland periods are frequently found in the same feature vividly demonstrates the fact that the tool-makers working at the site casually littered the area with discarded tools, preforms and debitage. Combined with the evidence for a long tradition of burial of the dead at the site, the overall impression gained is one of people who were, quite literally, living and dying with the vast quantities of refuse produced by their ancestors immediately underfoot. The implication of such evidence is one of a great measure of permanence at, and identification with, this particular location, spanning over a thousand years.

In many respects, the extensive and intensive occupation of the site contrasts with the prevailing ethnographic models of post-Paleoindian quarry use in the Northeast. Any effort to begin the process of understanding the roles of a site such as Peace Bridge, which was a combination of

quarry and workshop, warm-weather, riverine macroband settlement and cemetery, must begin with a consideration of the role of quarry sites within pre-contact subsistence-settlement systems, and the character of interaction between pre-contact communities. The first is that of the incorporation or “embeddedness” of chert procurement activities within the overall range of mobile hunter-gatherer subsistence pursuits. The second is that of the degree to which access to major chert sources was subject to some form of territorial control. Related to the question of territorial control is that of the role that a site such as Peace Bridge played as a place with historical and social associations that are inextricably tied to ideas of community. Related to this, in turn, is the sacred character of quarries and toolstone, as has been documented amongst many aboriginal societies in the Northeast. All of these questions have significant implications with respect to the apparently intensive and extensive character of occupation in the vicinity of the Peace Bridge quarry.

Among those who have conducted ethnographic studies of hunter-gatherer quarry use, there is general agreement that, in most cases, exploitation of such sites was fully integrated or “embedded” within the overall subsistence system (e.g. Binford 1979:259-261; Johnson 1984:235; Brumbach 1987:82; Holen 1991:404, 406; 409-410; Reher 1991:276-279; but cf. Gould and Saggers 1985). That is, rather than lithic procurement forming a distinct objective of travel to a known source area, such activities were likely to have been carried out in conjunction with the exploitation of local faunal and plant resources. As the above evidence suggests, that was certainly the case for the Early Woodland Meadowood occupants of the site, who appear to have used the site in the spring and fall for focused net fishing in the Niagara River and lake, deer and small mammal hunting, and mast procurement.

In their consideration of Late Archaic Small Point tradition chert procurement strategies in southwestern Ontario, Chris Ellis and Mike Spence refer to a similar approach by which chert was acquired incidentally to other activities as

one of “casual-embeddedness” (Ellis and Spence 1997:135). In such cases where stone extraction and tool production seem to have been of secondary importance, the labour expended on quarrying and reduction is likely to have been carried out in an ad hoc manner, and the evidence of formal tool manufacture is likely to be comparatively slight (cf. Ericson 1984:7). At the other end of the continuum, some quarry sites are likely to have been targeted for longer term occupation during which other resources could be exploited (Johnson 1984:235). Such a strategy approximates what Ellis and Spence have termed “direct-embedded” procurement, although they did not consider the potential long-term occupation of the chert source site itself, or its use as the central base from which other types of resource procurement were carried out. Such a scenario would result in indications of more permanent habitation, at which the manufacture of finished tools or refined tool preforms was carried out in conjunction with hunting, fishing and plant collection—a clear characterization of the Meadowood occupation of the Peace Bridge quarry site.

In addition to being a place of the living, the Peace Bridge quarry also served as the final resting place of the dead, for the site includes a significant mortuary component. Twenty of the roughly 380 features excavated between 1994 and 1996 represent burial deposits, many possibly representing burial places for Late Archaic and Early Woodland individuals.

Given the presence of both the Middlesex period internment and red ochre burials near identified Meadowood features, it appears that the site was also used by Early Woodland peoples as a final resting place for their dead. Moreover, the complexity of biface caching behaviour, and the apparent range of intentions implicit in this practice (Williamson 1996), at least some of which appear to be directly related to commemorating the sacred origins of the toolstone itself, it would be a mistake to assume that the caching of chert tools at a quarry simply indicates the storage of surplus material. Rather, it should be recognized that caches, as votive offerings (Bradley 1992; Osborne 2004; Williamson 1996), may empha-

size the perceived historical and social associations of a specific place, or may act as expressions of gratitude to the supernatural forces that first provided the resources this place offered.

The ceremonialism associated with the use of the Peace Bridge site, in concert with the settlement pattern and other evidence, suggests the emergence and maintenance of an increasingly strong sense of social or community identity with this locale. It would appear that these associations were already experienced during the Late Archaic, the earliest period for which substantial evidence has survived at the site, even if the site simply functioned as a spring and summer riverine macroband settlement within a mobile foraging subsistence cycle.

The limited ethnographic evidence available concerning the role of quarry sites in the economies of hunter-gatherer groups suggests that, in general, quarries were considered to be open territory, and that little attempt was made to control these locations (e.g. Ericson 1984:3). According to this model, quarries appear to have been regarded as “neutral territories”, which could be visited by various autonomous, although perhaps related, regional groups. This characterization of quarry access is also in keeping with ethnographic evidence for the prevalence of concepts of non-private ownership among hunter-gatherers. Territories tended to be defined on the basis of the use of the paths that exist between specific resource locales or places, which collectively define and structure personal and social existence (Robertson 1997). Rather than delineating boundaries and laying claim to contiguous areas of space, hunter-gatherers tend to negotiate access to resources (that is, the use of paths to get to specific places) with their immediate neighbours (Ingold 1986; Wilson 1988). Although a band’s customary use of a specific area may bestow certain preferential rights, it is rare that these rights extend to exclusive control or “ownership” in our sense of the term. It is likely, however, that some effort was made to avoid potential conflicts between different groups on such “neutral” sites. Such measures might include the payment of small gifts between groups (Ericson 1984:3), or policies of avoidance (Stewart

1987:54), by which those seeking to replenish their supplies of stone would visit the quarry for only as long as was required to collect material, which would then be reduced at workshop sites located in the surrounding hinterlands. Another means of reducing potential conflict between different groups at the source may have been by minimizing the number of people charged with the task of obtaining chert. Both ethnographic and archaeological studies have suggested that task groups of only one or two individuals could, on a single trip to a quarry, satisfy their family’s yearly requirements for raw materials (cf. Gould and Saggars 1985:120; Leudtke 1984; Stewart 1987:54), although it seems likely that the raw material needs of those who utilized more sophisticated tool kits, as are characteristic of the Late Archaic and Early Woodland, were greater. Those chosen to make the trip to the quarry, to engage in some primary reduction activities at the source, and perhaps further secondary reduction and/or preform manufacture at nearby workshops, may have been part-time “specialists”, either as a consequence of their particular skill as flintknappers or for more subtle reasons. In view of the sacred character and associations of quarries and toolstone in many societies in the Northeast (Hall 1983; Hammell 1983; Moulton and Abler 1991; Williamson 1996; cf. Gould and Saggars 1985:121), the task groups may have been limited in composition to those who fulfilled certain criteria, be they gender- or kinship-based or otherwise defined.

Yet the evidence available from the Peace Bridge site seems to indicate that the quarry area was occupied for extensive periods of time by people who were also there to exploit its rich aquatic resources, rather than by small, circumspect, work parties that quickly gathered the chert which they required before retiring to more distant locations, to reduce it into more manageable forms, before their return journeys home. The long-term use of the site, which included the development of formalized cemeteries, may therefore point to a different or evolving pattern, whereby the emphasis of ancestral rights to—and imposing symbols of permanence upon—the landscape was or became increasingly important.



Assuming these groups did assert some degree of control over the quarry and the other resources of the immediate vicinity, it thus seems possible that, at certain times, the site functioned as a major source of finished tools, which along with preforms and perhaps unmodified raw material, were subsequently circulated inland to other communities. This may have been the case during the Late Archaic and Early Woodland periods, given the wide distribution of both Genesee type projectile points made from Onondaga chert throughout the Niagara peninsula, the north shore of Lake Ontario, and western New York (Burgar 1985:10; Ellis et al. 1990:100; Ritchie 1971:24; Ritchie and Funk 1973:47; Funk 1976:261-263; Funk and Rippeteau 1977:31; Kenyon 1980:11-12; Funk 1993:195-196) and the even wider distribution of Onondaga chert Meadowood preforms, which occur individually and in sizable caches, primarily in southern Ontario and western New York, but also from as far afield as the northern shore of Lake Superior, the St. Lawrence River valley, the Atlantic seaboard, and in Michigan and Ohio (Spence and Fox 1986; Ferris and Spence 1995).

What is clear, however, is that no one model of Early Woodland lithic procurement strategies or exchange patterns can account for the entire range of actual practice in the past. In order to achieve a more complete understanding of the social and economic organization of pre-contact chert procurement and exchange in southern Ontario and the Great Lakes area in general, more detailed analyses are required of both quarry sites themselves, and of the lithic industries that are found on the myriad of other sites which make up the many local and regional subsistence-settlement systems of the region.

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