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Culloden Acres (AfHj-90): A Small Early Paleo Site near Komoka, Ontario

Christopher Ellis and D. Brian Deller

The Culloden Acres site was excavated in 1990 as part of a project investigating small, fluted point–related sites. One goal was to correct biases in previous work that had focussed on larger sites, ones dominated by biface recoveries, and locations near the pro-glacial Lake Algonquin strandline. Another goal was to explore characteristics of small sites that others had suggested were advantageous to finding out about past peoples' lives. Smaller sites are more likely to represent short-term occupations. Hence, they have a greater probability of having intact spatial patterning, with tools deposited in locations where they were actually used, and of informing us about how activities, and potentially labour, were organized. Two main areas of activity were delineated at the site. One area was dominated solely by fluted point manufacturing debris and the other was dominated by trianguloid end scrapers, which, many lines of evidence suggest, are hide-working tools. Comparable contrasting spatial distributions of this kind are suggested within and between loci at several other Paleo sites in southern Ontario and elsewhere, and potential reason for such spatial organizations are reviewed. Although no fluted points were recovered, raw material preferences and comparisons with other site assemblages, notably of the channel flakes and end scrapers recovered, suggest that Culloden is an early dating Gainey phase–associated Paleo site.

Introduction

We report here on our work at the Culloden Acres site (hereafter Culloden), a small Paleo[1] site in southwestern Ontario (Figure 1). The site was surface-collected and excavated by the authors as part of a 1990 project. The overall aim of that project was to expand knowledge of the range of variability in Ontario fluted point–related sites. Three sites were chosen for study: Bolton, Murphy, and Culloden. Detailed reports on the first two sites have been published (Deller and Ellis 1996; Jackson 1996), but Culloden has not been reported except for some brief references (Ellis and Deller 1991a; Ellis et al. 1992; Ellis and Poulton 2014) and, of course, a more detailed but unpublished archaeological licence report (Ellis and Deller 1991b).

These sites were selected for investigation based primarily on three ways in which they differed from most Ontario sites that had been researched at the time. Several biases in earlier research were recognized, and investigators saw a need to rectify the situation (Deller 1988; Ellis

[1] *Paleoindian, Paleoamerican,* and *Paleolithic* are all problematic terms, for different reasons (see Ellis 2014:5764, 2017; Gillespie 2003; Meltzer 2009:175–176, 205; Yellowhorn 2003). But there is a need for a non-problematic term of broader reference that is useful in contexts beyond Ontario's borders, to facilitate external archaeological comparisons and dialogue and to reference certain sites with well-documented characteristics, notably in terms of details of lithic assemblages. We think that, for the time being, *Paleo* suits that purpose.

Figure 1. *Location of the Culloden Acres site, other sites mentioned in the text, and raw material outcrops. Site locations are marked by stars and labelled in italics.*

1994; Ellis and Deller 1980; Jackson 1990, 1994; Jackson and McKillop 1987, 1991). The criteria used to select sites for investigation included the following:

(1) All three sites were quite small in terms of both spatial extent and artifact yield. Most previous research had focussed on larger sites. The small sample of only nine sites that had seen more than simple test excavations included the four largest Ontario sites in terms of spatial extent and artifact yield known at the time (Parkhill, Fisher, Udora, and Thedford II; see Deller and Ellis 1992a, 1992b; Roosa 1977a, 1977b; Storck 1983, 1988, 1997; Storck and Spiess 1994; Storck and Tomenchuk 1990). Indeed, by the 1980s, in Paleo studies throughout the Northeast, with some exceptions (e.g., Curran 1984; Spiess and Wilson 1988; Storck 1979; Wright and Roosa 1966), a "bigger is better" syndrome had mostly prevailed, with large sites, such as Debert, Nova Scotia (MacDonald 1968); Shoop, Pennsylvania (Cox 1986; Witthoft 1952); Bull Brook, Massachusetts (Grimes 1979); Thunderbird, Virginia (Gardner 1983); Gainey, Michigan (Simons et al. 1984); Vail, Maine (Gramly 1982); and Nobles Pond, Ohio (Gramly and Summers 1986) receiving the vast bulk of the archaeological attention.

Aside from a large site focus skewing our view of such aspects as settlement systems and mobility patterns, at a more theoretical level, small sites potentially have greater importance for our understanding. It has been recognized for some time that spatially small, low-artifact-density sites have certain advantages for informing us about various aspects of past people's lives (e.g., Finlayson 1977:226–227; Moseley and Mackey 1972; Shiner 1970). Of note, small sites are more likely to have certain kinds of intact spatial patterning in the distribution and association of artifacts. Among other things, this means they have more potential to inform us as to the uses of tools and of the tool classes used together in the same tasks (that is, "tool kits" or what Schiffer [1976:45, 66–70] called "basic or single" activity sets). Larger sites have a greater probability of representing longer-term use, including perhaps multiple palimpsests of overlapping occupations and different activities. These factors may have resulted in more trampling and the scattering of artifacts underfoot and would have required considerable housekeeping, including purposeful cleaning and specialized refuse disposal. Housekeeping is more commonly carried out at substantial, longer occupations to increase the comfort of the occupants (see Schiffer 1987; Stevenson 1985). Such behaviour can obscure certain spatial patterning in such aspects as activity organization. In addition, among hunter-gatherer or foraging societies, smaller sites are more likely to represent special activity sites occupied by only a certain segment of the population, essentially a task group organized for a limited range of very specific purposes, such as camps used to intensively butcher animal kills or to intensively process resources, such as hides. Ethnographically, such tasks groups are often organized along gender lines (Sassaman 1992:220; Stevenson 1991:286–292). Overall, these characteristics mean that variability in small site tool assemblages can provide much more informative clues to the uses of specific tools, and to how Paleo groups spatially organized their labour and activities, than can many larger assemblages or sites.

Studying such small sites, however, is not without problems. For example, the representation

in the archaeological record of certain activities carried out at short-term occupations can be limited. Certain stone tool–related activities may be carried out but will not be represented archaeologically: Because the average application life of a particular tool form could exceed occupation length of the site, tools may not be discarded where they were used (Shott 1989a, 1989b). Therefore, it behooves the investigator(s) to demonstrate that such a factor is not substantially biasing the recovered artifact assemblage.

(2) Unlike most Ontario sites excavated prior to the 1990s, the sites to be investigated in our project were "interior" sites not associated with the strandline of pro-glacial Lake Algonquin/Ardtrea (see Jackson et al. 2000) to the north, in the modern Lake Huron drainage basin. This strandline focus had the potential to skew our interpretations. For example, one reason for the focus on large sites has been to delineate the range of tool forms produced by these groups. Yet, from our 1980s knowledge of mostly surface-collected smaller sites in southwestern Ontario not associated with the Algonquin strandline, it seemed clear these sites consistently included artifact forms rarely found on the strandline sites, such as *pièces esquillées* (scaled pieces), an inference supported by subsequent research (e.g., Deller et al. 2018). Also, one could argue that the focus on large sites and, to some extent, on Algonquin strandline sites has biased our time/space constructs. It was only just before the Culloden project that we had argued for a distinct "Crowfield phase" as the third of three (Gainey, Parkhill, Crowfield) time-sequential, Early Paleo lithic industries in the eastern Great Lakes. This recognition only came about through the excavations at the small, interior Crowfield site (Deller and Ellis 1984). We suggested (Deller and Ellis 1988) that this complex had previously gone unrecognized because it is not as well represented in certain areas of the Algonquin strandline that have seen extensive investigation (e.g., the Parkhill area). Also, Crowfield sites as a whole seemed to be more often small and ephemeral (e.g., Deller and Ellis 1996; Stewart 1984; Storck 1979; Timmins 1994). Subsequent research has supported that argument (e.g., Hanson 2010), as well as revealing Algonquian strandline–focused biases against finding the very earliest sites, particularly substantial ones with larger, more parallel-sided fluted points (Deller et al. 2018; Ellis 2017; Ellis et al. 2011; Hanson 2010). Indeed, we suspected that Culloden was not a Parkhill/Barnes or Crowfield phase site but, instead, represented groups who made the earlier, more parallel-sided forms. These points have been variously referred to in the older literature by the terms Enterline, Gainey, and Clovis (Ellis and Deller 1990; Roosa 1965; Roosa and Deller 1992). The more recent research on sites in other areas of Ontario has also revealed the biases of an Algonquin strandline focus in our knowledge of Paleo lithic source use preferences (e.g., ASI 2007; Deller et al. 2018; Ellis and Poulton 2014).

(3) Finally, unlike most previous intensively researched sites, two of the sites we investigated were dominated more by unifacial tools rather than by points/bifaces, which, it was suggested (e.g., Jackson and McKillop 1987), was skewing our view of Paleo inter-assemblage variability. In turn, this bias would skew our interpretations of subsistence foci, settlement systems, and activity organization. For example, ethnographically, stone projectile tips are associated almost exclusively with the hunting of large to medium-sized game animals (Ellis 1997), and a focus only on sites with many of such points may reify or exaggerate the old stereotype of Paleo peoples as specialized hunters of larger game. Also, the ethnographic record suggests that larger game hunting per se is predominantly a male activity (e.g., Kelly 1995:262–270), potentially biasing a focus on such sites against female activities (Sassaman 1992).

The Culloden Acres Site

The Culloden Acres site was brought to our attention in 1988 by a local resident, Darcy Fallon. During surface collecting, the discoverer recovered several tools and some waste flakes from a cultivated field surface. While these included no fluted bifaces, they did include a distinctive channel flake from fluting. The tools found consisted solely of unifaces, and the debris

included mostly small scraper/uniface retouch flakes (cf. Frison 1968). However, among the unifaces were distinctive Paleo tool forms, including trianguloid end scrapers and a well-made multiple graver or micro-piercer. Moreover, almost all of the tools/artifacts from the site were on the distinctive Collingwood variant of Fossil Hill formation chert (see Storck and von Bitter 1989), bedrock sources of which are located some 180 km northeast of the site (Figure 1). Throughout much of southwestern Ontario, from about the London area west, this highly distinctive material was used almost exclusively by Early Paleo groups, with little use in subsequent times (e.g., Deller and Ellis 2011).

Culloden is situated on a slight rise that is apparently on a remnant of a sand dune (Karrow 1995, 2012; Warner et al. 1991). The location had been inundated by an early high-water level of pro-glacial Lake Maumee (Maumee II) in the modern Erie basin prior to 14,000 RCYBP and was first exposed when water dropped to a subsequent lower Maumee level shortly thereafter (Figure 2; Calkin and Feenstra 1985). At that time, the recently exposed surface, which lacked stabilizing vegetation, was reworked, forming the dune itself, as well as several other dunes in the area, such as at the nearby Bolton site (Deller and Ellis 1996). Subsequently, at ca. 13,000 RCYBP, the water levels rose to a Whittlesey level, which filled the western Erie basin and extended into the southern part of the modern Huron basin. This lake level again flooded the Bolton site location but never reached the elevation of Culloden. As is typical for many Paleo sites, both Bolton and Culloden are in elevated locations, with southern exposures and overlooking larger areas of "muck soils" (see Deller 1976, 1979, 1988; Deller and Ellis 2011:5).

While there are other traces of Paleo activity at the site, the main Culloden site consists of at least two discrete, more substantial spatial clusters of artifacts called Areas A and B (see Figure 3). Some other surface traces of Paleo use occur at the southern edge of the site as indicated by Collingwood chert artifact recoveries. One of these traces, called Area C (Figure 3), yielded a single tool (a *pièce esquillée*) and two waste flakes, but the testing did not recover any other evidence of Paleo activity. Another surface find, an isolated

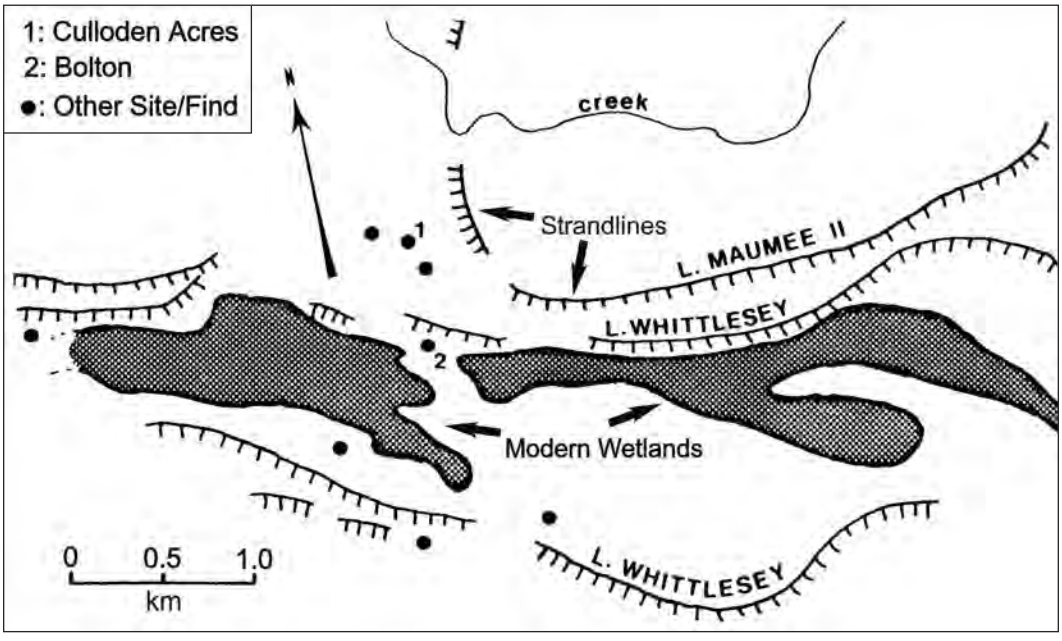


Figure 2. *Location of the Culloden Acres and Bolton sites and other site/findspot locations in relation to abandoned glacial strandlines and modern wetlands.*

one, was the the tip of a large, Collingwood chert biface fore-section with a slightly bevelled lateral edge found on a west to east–trending ridge some 60 m to the south. On an adjacent farm just to the northwest is a site called Samplonious, which yielded only a few surface finds of Collingwood waste flakes (Ellis and Deller 1991b:125–127).

Area A is the largest location, covering about 200 m^2. It is at the northern edge of a cultivated field and extends slightly north into what is today a wooded area (Figure 3). Other areas may be located more removed to the north in the woods,

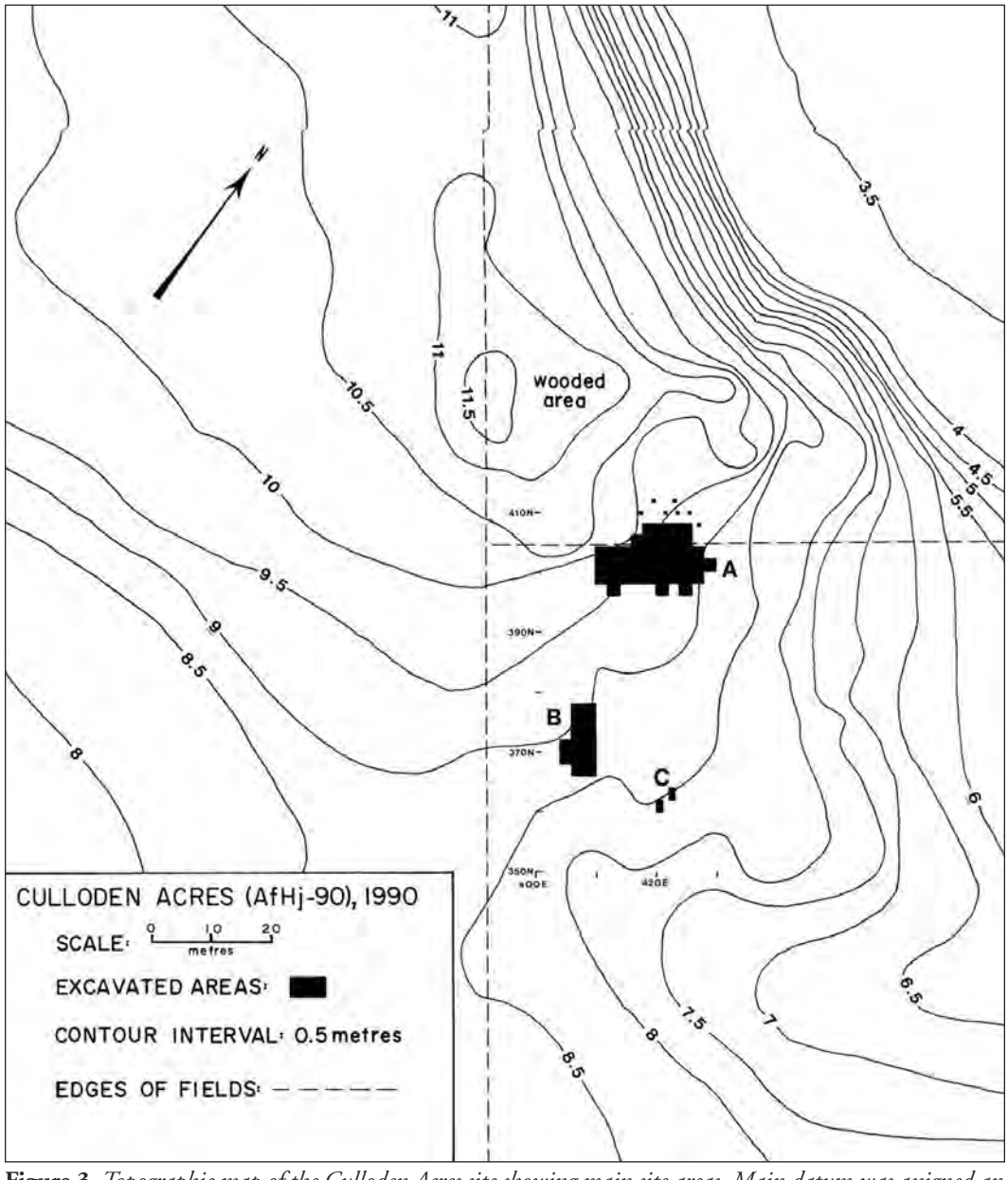


Figure 3. *Topographic map of the Culloden Acres site showing main site areas. Main datum was assigned an arbitrary elevation of 10 m.*

given the finds on the ploughed Samplonious site to the west (Ellis and Deller 1991b:125–127). However, except for being subjected to test pitting to determine the northern extent of Area A, the wooded region has not been extensively investigated. Area B is much smaller, covering ca. 80 m^2. In addition to a Paleo component, there are traces of Archaic as well as Middle Woodland and historic Euro-Canadian use of the main site location.

Field Methods

In addition to the excavations and testing, and aside from surface collection, we also experimented with use of geophysical techniques to locate subsoil anomalies, but these were unsuccessful (see Nobes 1994). The excavations were undertaken in relation to a grid of two-metre squares. These units were referred to by the intersection co-ordinates of the grid lines at their southwest corners. For the site as a whole, the four one-metre subsquares in each unit were excavated separately, the ploughzone being screened using ¼" (6.4 mm) mesh in three of those units and 1/8" (3.2 mm) in the remaining, northeast, one-metre subsquare. Once the ploughzone had been removed from a unit, the subsoil surface was examined for potential features. If no obvious features were present, at least the top 5 cm of the subsoil was shovel shined and screened. Excavators switched to trowelling and fine excavation tools if any items were encountered. All shovelled ploughzone and subsoil sediment was screened one shovelful at a time, and any recovered tools were piece-plotted to the centre of the removed shovel load; flaking debris was bagged mostly by unit and level.

Area A

Area A is located at the north/northeast edge of the site, adjacent to the woodlot. In order to determine the extent of the area in the currently wooded, unploughed area, a series of 50 × 50 cm units were dug with shovels and their contents was screened. Such smaller units were considered more ideal in the wooded area, as they would "disturb" a smaller surface area. If undisturbed Paleo materials were found in the woods, they were to be excavated with fine tools and everything was to be piece-plotted. These 50 cm^2 test units were dug in what would have been the northeast subsquare of the two-metre units (Figure 3), and 3.2 mm mesh was employed in an attempt to find traces of a Paleo occupation in those areas. The finer mesh needed to be used as most of the Paleo waste flakes from this site area are so small that they would not have been recovered in 6.4 mm mesh; this is a problem encountered on other Paleo sites, especially those where unifacial tools and associated debris predominate (Deller and Ellis 1992a:91).

While we did find material in the wooded area tests units, we also found evidence that the southern edge of this area had been ploughed in the past. It would appear that the original field edge was some 6 m north of where it is situated today. As the trees grew out over the field edge and prevented the landowner from ploughing along that edge, the field margin and tree brush/growth moved progressively south over time. Any test units located beyond the original ploughed edge, as well as the holes we dug to insert two permanent datum points in that same area (the sediment from which was also screened with 3.2 mm mesh), yielded absolutely no evidence of Paleo use.

Besides Paleo materials, diagnostics were recovered from Area A that indicate use by several later groups (Figure 4). In addition to two ground stone tool fragments, these items included (1) a single bifurcate base point (Figure 4a) on a higher-quality, unmottled, darker grey, Onondaga chert indicating some minimal Early Archaic use (ca. 8900–8000 RCYBP); and (2) two broad-bladed, side-notched points and a probable tip of another evidencing a Middle Archaic occupation (Figure 4b–d). The one point is on Kettle Point chert, and the other point and the tip are on Selkirk chert (see Fox 2009). Although it is possible that these represent an Early Archaic Side-Notched horizon occupation, the points seem to most closely resemble Otter Creek– or Godar-type forms found in surrounding areas (Perino 1973; Ritchie 1971) and should date to ca. 6500 to 5000 RCYBP (Brown and Vierra 1983; Clermont et al.,

editors, 2003; Funk 1988; Lovis, editor, 1989). There are also two preforms whose size and morphology strongly suggests that they are associated with these points; one is on a low-quality, limestone-mottled, light grey Onondaga chert; one is on Kettle Point chert. A final recovery is a small, notched, "Small Point" Late Archaic biface on Kettle Point chert (Figure 4e; ca. 3500–2800 RCYBP; see Ellis et al. [1990, 2009] for a more detailed discussion of these various Archaic manifestations). In terms of size, this last point seems to most closely resemble examples of the Crawford Knoll type (Ellis et al. 1990:107; Kenyon 1989).

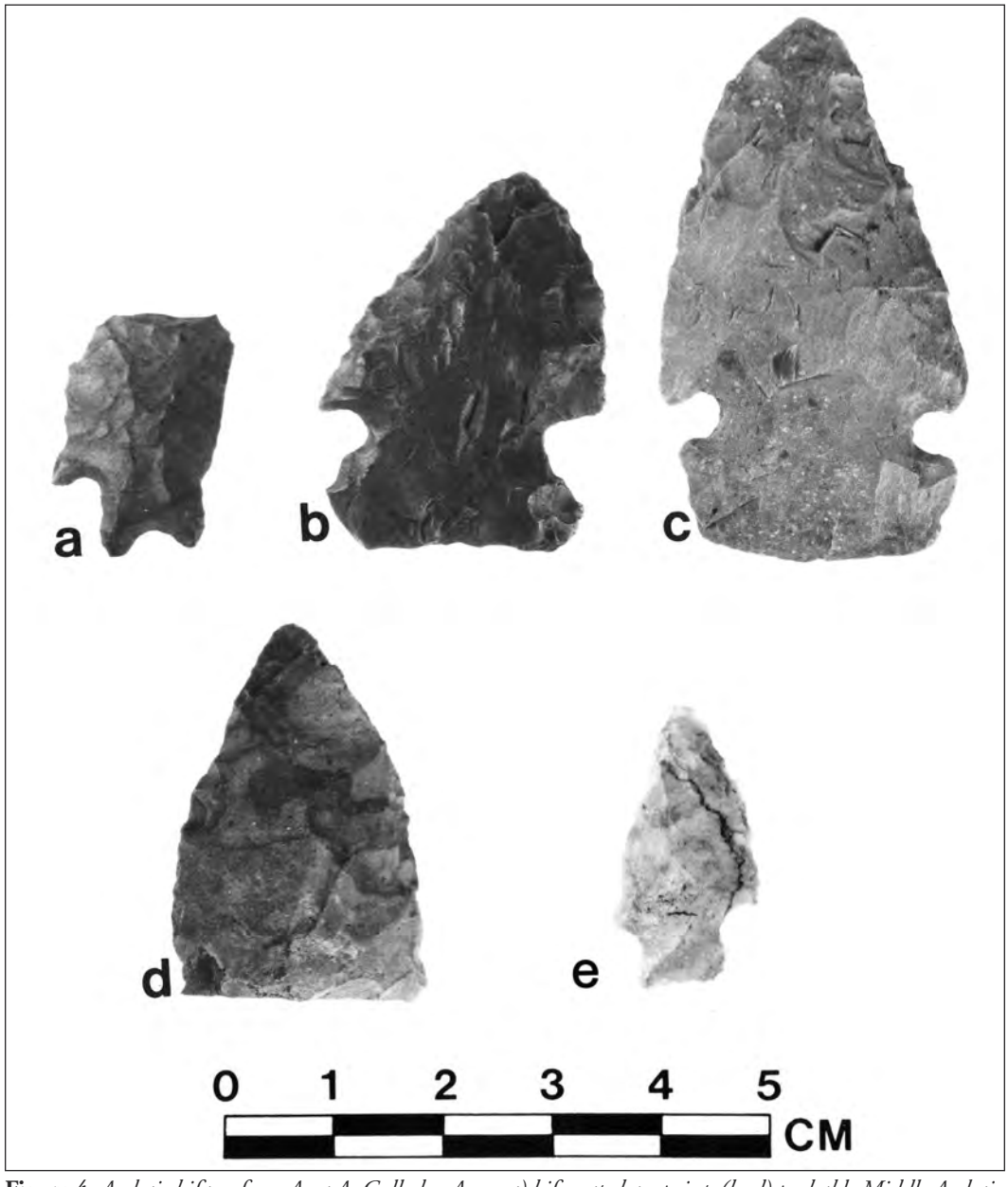


Figure 4. *Archaic bifaces from Area A, Culloden Acres: a) bifurcate base point; (b–d) probable Middle Archaic side-notched points and biface tip;(e) Late Archaic smallpoint.*

Table 1. *Paleo Tools from Area A, Culloden Acres.*

	Chert Type			
Tool type	**Collingwood**	**Onondaga**	**Other**	**Total**
Trianguloid end scraper	21 95.5%	-	1 4.5%	22 100.0% (33.3%)
Retouched flake/ denticulate	7 100.0%	-	-	7 100.0% (10.6%)
Graver/micro-piercer	2 100.0%	-	-	2 100.0% (3.0%)
Side scraper	-	1 100.0%	-	1 100.0% (1.5%)
Notch/borer/ denticulate	1 100.0%	-	-	1 100.0% (1.5%)
Wedge	-	-	1 100.0%	1 100.0% (1.5%)
Pièce esquillée	-	1 100.0%		1 100.0% (1.5%)
Snapped-edge denticulate/cutter	-	1 100%		1 100% (1.5%)
Unifacial tool fragment	28 93.3%	1 3.3%	1 3.3%	30 99.9% (45.5%)
Total	59 89.4%	4 6.1%	3 4.5%	66 100.0% (99.9%)

Note: Totals in parentheses represent percentage of that tool type/class in total Area A sample, including tool fragments.

The Paleo Assemblage

We assign 66 lithic tools or fragments thereof and 388 waste flakes to the Paleo component at Area A (Tables 1 and 2). These items are almost exclusively on primary source Collingwood chert; more rarely, they are on the higher-quality, also probably bedrock-derived, Onondaga chert. Exceptions among the tools include one tool on the meta-sediment sub-greywacke, a typologically Paleo end scraper on an unknown material, and a single tool fragment on what appears to be Upper Mercer chert, from central Ohio (Table 1). The closest Onondaga outcrops are some 130 km to the southeast of the site (see Parkins 1977), and those of Upper Mercer are located 300 km to the southwest. There is also a single quartz waste flake recovered from a Paleo feature and seven sub-greywacke waste flakes from the ploughzone that we also assume are Paleo associated.

All other lithics recovered are assigned to the later components. Detailed analyses of the distribution of the later-dating diagnostics listed above, along with other items, including flaking debris on comparable raw materials (lower-quality, mottled, and lighter grey Onondaga chert [n = 62]); Kettle Point chert [n = 97]), shows that they cluster in two places within Area A; match the distribution of Middle and Late Archaic finds, respectively; and contrast in distribution with the Paleo artifact recoveries (Ellis and Deller 1991b). Also, Paleo subsoil feature remnants yielded none of these raw materials, suggesting that most, if not all, of the items made on these materials are associated with the later-dating Area A components.

Four tools recovered from Area A were made on the high-quality, less mottled, somewhat darker grey Onondaga. Three of these tools, a side scraper (in two pieces), a snapped-edge denticulate, and a fragmentary *pièce esquillée*, typologically resemble Paleo forms but are not ones characteristic of the Archaic components. Also, a fragment of the side scraper and two waste flakes on the same material were recovered from one probable and one definitive Paleo feature (Features 2 and 3; see below). Thus, we assume that these higher-quality Onondaga tools, along with a tool fragment and the flaking debris, are associated with the Paleo

Table 2. *Paleo Waste Flake Counts and Weights from Area A, Culloden Acres.*

	Chert Type			
Debris type/class	**Collingwood**	**High-Quality Onondaga**	**Other**	**Total**
Channel flake	-	-	-	-
Biface thinning flake	-	-	-	-
Biface finishing flake (mean weight = 0.12 gm)	2 (33.3%) [0.38 gm]	4 (66.6%) [0.38 gm]	-	6 (99.9%) [0.76 gm]
Uniface retouch flake (mean weight = 0.07 gm)	180 (98.9%) [11.67 gm]	2 (1.1%) [0.13 gm]	-	182 (100.0%) [11.80 gm]
Fragment (mean weight = 0.03 gm)	183 (91.5%) [4.42 gm]	10 (5.0%) [1.19 gm]	7 (3.5%)	200 (100.0%) [5.61 gm]
Total (mean weight = 0.05 gm)	365 (94.1%) [16.47 gm]	16 (4.1%) [1.70 gm]	7 (1.8%)	388 (100.0%) [18.17 gm]

Note: Weights exclude the seven items that are not on chert. Numbers in brackets represent the total weight of all chert items in that type/category

component. Of course, some of these items, including the debris, may be associated with the later components, because that Onondaga material was also used to manufacture the single recovered Early Archaic point (Figure 4a). Nonetheless, the very few pieces of flaking debris on the higher-quality Onondaga material (n = 16) contrast typologically with the debris on the lower-quality Onondaga material. They more closely resemble debris also seen in the Collingwood chert Paleo assemblage, such as a dominance of flakes from finishing or resharpening, including uniface retouch flakes (see below; Ellis and Deller 1991b), suggesting that they relate to the Paleo component. It is possible that some of the lower-quality Onondaga items are also associated with the Paleo occupation. Based on preserved surfaces of the original raw material pieces, this lower-quality material derives from secondary deposits, perhaps from areas of the Thames River valley about 6 km away. Their presence may indicate more expedient use by Paleo groups, but there is nothing in the spatial distributions or Paleo feature data that supports this suggestion.

Primary Flaking and Core Reduction. As is the norm on Early Paleo sites in southwestern Ontario (see Deller and Ellis 1988, 1992a, 1992b; Ellis 1979, 1984, 1993), the lithic debris from the site was not derived from the initial stages of the reduction of the raw material. As we describe below, this debris is dominated by very small retouch flakes or flake fragments. Therefore, knowledge of the primary flaking sequence and core forms must be derived from the flakes made into or used as tools. Given the small number of tools from Area A and the fragmentary nature of many of these items, it is not possible to develop as detailed models of this reduction sequence as was the case at other analyzed sites (e.g., Deller and Ellis 1992a; Ellis 1984); consequently, core reduction is only briefly considered here.

Blanks detached from three general categories of core forms are present in the assemblage. First, there are at least five blanks derived from large, probably oval-outlined, bifacially worked cores. These blanks exhibit several characteristics that betray their derivation from such cores, including a large size, thinness, expanding lateral edges from the platform, and the presence of longitudinal curvature. However, the most distinctive characteristics consist of the following: an acute angle between the platform surface and dorsal flake surface at the proximal flake end; platforms heavily prepared by grinding and often by purposeful faceting; dorsal scars that are convergent-to-parallel in orientation vs. the mid-line of the flake under examination; and bidirectional dorsal scars, as is to be expected on flakes derived from cores with two opposing edges or platforms. Flakes from large biface cores (estimated to be ca. 60–100 mm across) are a common form at numerous Paleo sites, not only in the Northeast (e.g., Deller and Ellis 1992a; MacDonald 1968; Payne 1987; Wright and Roosa 1966), but also elsewhere in North America (e.g., Hofman et al. 1990; Wilke et al. 1991). Their consistent presence at Culloden reinforces the Paleo affiliation of the assemblage.

A second category of blanks is referred to here as biface thinning flakes. These essentially exhibit the same characteristics as the previous category of blanks. They differ mainly in that they are much smaller than the flakes from biface cores. Rather than being derived from very large bifaces, they are of a size and curvature in profile suggesting that they were detached from small bifaces approximating fluted point preforms (e.g., bifaces of ca. 25–35 mm wide). There are two biface thinning flakes made into tools from Culloden Area A. One of these is a lateral or normal biface thinning flake expected from the alteration of the side edges of a relatively elongate biface. The other was struck off the end of such a biface and thus exhibits transverse dorsal scars indicative of previous normal biface thinning flake removals from the lateral edges. Again, use of both these kinds of biface thinning flakes as tool blanks is reported from several other Paleo sites (e.g., Deller and Ellis 1992a, 2011).

The final category of flake blanks includes a diversity of forms detached from cores with blockier to tabular outlines. Following Callahan (1979:41), we will call these "block" cores. At least 16 blanks in the Area A assemblage are derived

from these cores. The removal of these blanks from such cores is suggested by their relatively right-angled platforms; a high incidence of cortical or flat platforms lacking faceting; a relatively straight longitudinal profile; and, in general, their more pronounced bulbs compared with flakes from biface cores (see Ellis 1984; Lothrop 1988, 1989; Simons et al. 1984). Three specimens were detached from near and along right-angled corners of a block core form. Use of such blanks is again typical on many Paleo sites, and they have been referred to as corner-struck flakes in other site analyses (Deller and Ellis 1992a, 2011; Ellis 1984; Simons et al. 1984). Because of their removal along such right-angled junctures of two major core faces, they exhibit a single, pronounced dorsal ridge separating two relatively flat surfaces that meet at the ridge at a ca. 80–105° angle in transverse section. At least one of the dorsal facets is unflaked. The ridge represents the old intersection point of two major core faces, while the flat surfaces each represent a portion of the old major faces of the core itself. The remaining blanks from block cores are both derived from "flatter" faces of cores, as opposed to corners. Therefore, they are flatter in profile and lack the pronounced dorsal ridge seen on the flakes from corners of the core. Flakes from both unidirectionally worked (n = 8) and bidirectionally worked (n = 5) block cores are present. Five of these flakes retain facets of the original raw material surfaces, either as unflaked dorsal surfaces or as cortical platforms. So in total, a high percentage of flakes (8 of 15, or 53.3%) with original surfaces of block cores are present, suggesting that they are predominantly from the earliest stage of the reduction of initial raw material units. Some may even be from preparing original blocks to produce the biface cores, particularly the examples with bidirectional scars.

Trianguloid End Scrapers. These items (Table 3; Figures 5 and 6a–c) dominate the Area A assemblage, making up 33 percent of the tool assemblage (Table 1) and 66 percent of the tool assemblage excluding tool fragments unassignable to types. Also, the thick, steeply bevelled nature of many of the unifacial tool fragments leads us to strongly suspect that many of those fragments are from this kind of tool. The sample includes 12 specimens that are relatively complete, as well as 5 proximal end fragments and 5 bit/distal fragments. The blanks upon which the end scrapers were made can be determined on 13 specimens. At some other Ontario sites, such as Thedford II (Deller and Ellis 1992a:55), flakes from biface cores predominate as tool blanks for such tools. However, only three of the items from Culloden A are made on such blanks, the remainder being derived from the faces or corners of block cores. There is no doubt these tools were hafted, as indicated by, among other things (see Ellis and Deller 2000:102–108), proximal/platform ends that were snapped off in use that have old, weathered breaks and so are not a result of recent taphonomic processes, such as ploughing. The specific cause of such breaks[2] and their actual frequency can be debated (see Perrone et al. 2020). Yet, there is no doubt that reported examples of these tools did break during use while hafted, and predominantly early in the use life. This evidence includes longer snapped bit sections, which refitting studies indicate, were snapped off and then proximally reworked/narrowed to refit the haft (see Seeman et al. 2013:Figure 2; Iceland 2013:Figure 4) and the fact that snapped bits were derived from longer segments that had been less resharpened (Ellis and Deller 2000:106–107). One relatively complete item (Figure 5d) has been refit from two segments and exhibits an old, transverse snap. Notably, it is the thinnest end scraper in the sample (3.8 mm; Table 3). One would expect such thinner examples to be more susceptible to breakage in use.

Compared with many other assemblages, and as we will discuss more below, the Area A end scrapers are relatively small (narrow and short), with steep (predominantly 50–80o), flatter bits. These bit forms are suggestive of having been

[2] Possible explanations include: a remote fracture during resharpening in the haft, snapping during application to the material being worked, or even, perhaps, breakage in removing exhausted items that were wedged in their handles

Table 3. *Trianguloid End Scrapers from Area A, Culloden Acres.*

Cat. #	Length	Width	Thickness	Bit Width	Bit Depth	Bit Thickness	Bit Angle*	Lateral Divergence
1	-	25.6	8.6	25.2	2.8	6.3	45–70°	15–20°
2	24.7	23.9	6.2	21.2	3.5	5.8	65–75°	30–35°
3	25.9	21	4.6	17.4	3.3	4.6	60–70°	15–20°
4/112	24.4	23.7	6.7	21.6	2.7	6.2	50–75°	15–20°
5	-	23.9	8.8	23.9	3.5	8.2	60–80°	15–20°
49	30	30.2	12.2	23.4	6.6	8.4	65–80°	20–25°
128	28.6	21.2	6.4	21.2	4.4	4.9	50–60°	5–10°
129	25.4	21.5	5.8	21.4	3.8	5.3	45–65°	20–25°
132/154	38.4	25	3.8	24.6	7.2	3.8	40–50°	25–30°
135	34.7	28.2	10.2	28.2	6.2	10.2	70–95°	15–20°
136	26.4	22.4	10.1	22.4	4.8	10.1	-	-
144	28.1	24.3	6	24.3	4.9	6	50–65°	25–30°
149	28.2	23.9	7.8	23.9	4.4	6.2	55–60°	-
152	-	25	4.9	22.7	3.5	2.5	60–65°	10–15°
157	31.2	26.7	8.4	26.1	4.5	5.8	40–55°	45–50°
219	-	-	-	-	-	-	-	20–25°
226	-	-	-	-	-	-	-	15–20°

*Range of angles along bit edge has been rounded to nearest 5°.

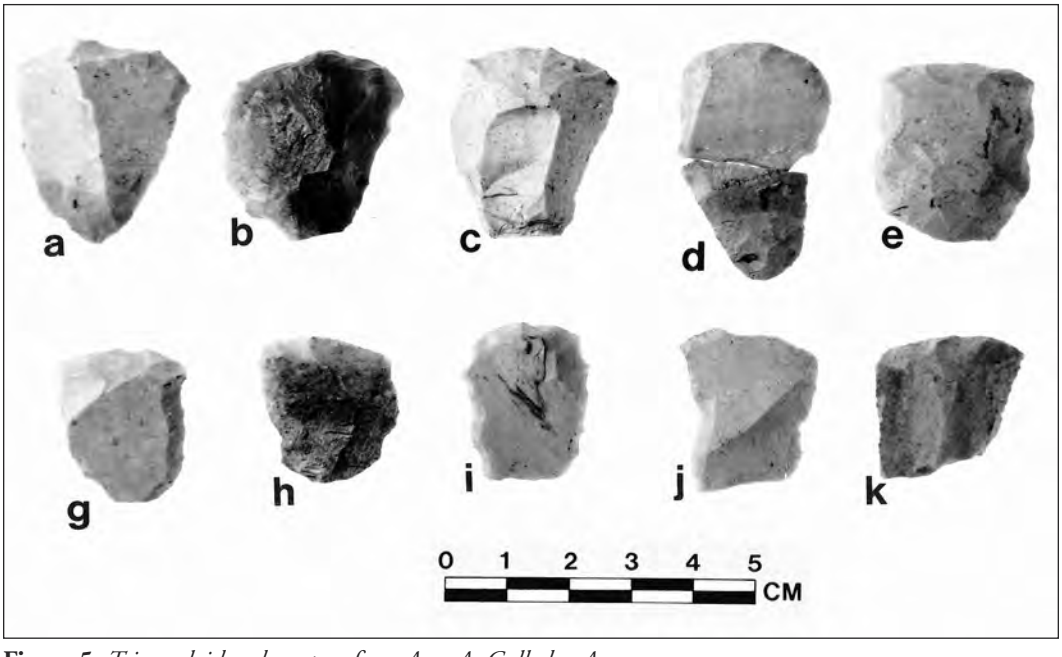


Figure 5. *Trianguloid end scrapers from Area A, Culloden Acres.*

heavily resharpened. Using bit depth as a simple proxy measure of bit flatness, it is notable that the shallower, less convex, flatter bits tend to be associated with shorter end scrapers (Figure 7). This difference suggests that the bits tend to become flatter through resharpening and that prior to resharpening, they would have been relatively more convex in plan view. It could be that as they get resharpened to short lengths, the corner of the bits encroached on the hafted area, prohibiting continued reduction at those corners (Ellis and Deller 2000:107).

The tools are notable in that all have only slight divergence between the side edges compared with end scrapers from other sites we have examined, such as Parkhill and Thedford II (Figure 8), and in that several also have paired shallow side notches or crushing (e.g., Figures 6a–c), both of which suggest predominantly hafting in handles with open sides, rather than in sockets.

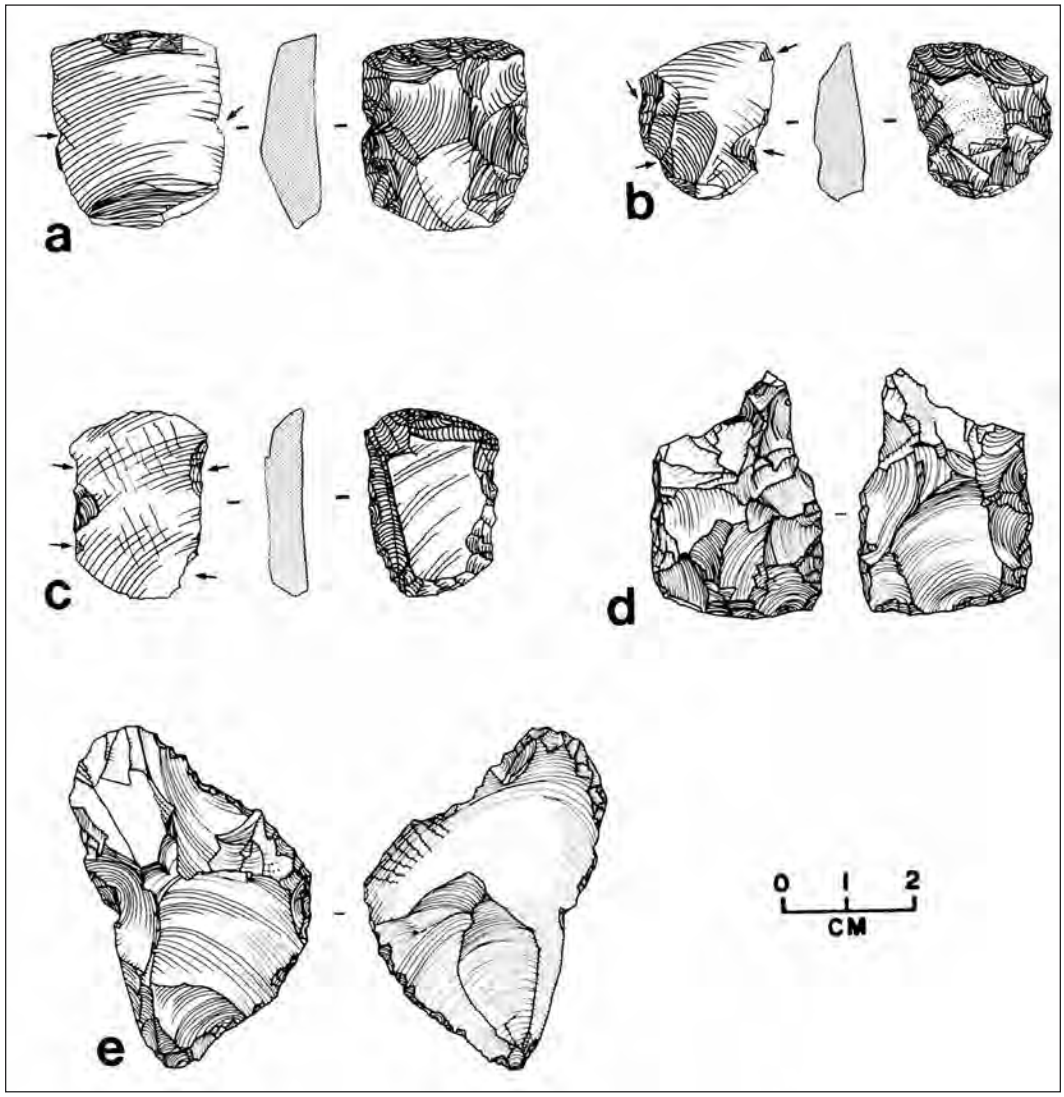


Figure 6. *Artifacts from Culloden Acres: (a–c) trianguloid end scrapers, Area A (arrows indicate lateral notches/crushing); (d) pièce esquillée, Area C; (e) retouched flake/denticulate, Area C.*

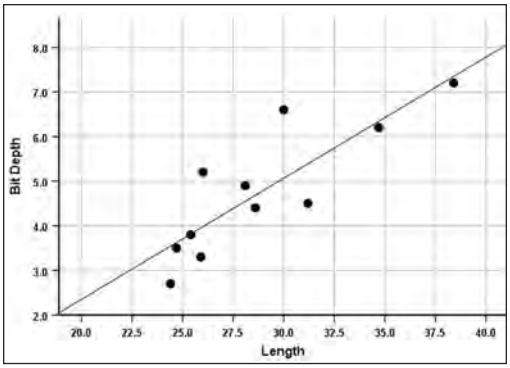


Figure 7. *Relationship between end scraper length and bit depth at Culloden Acres (R^2 Linear = 0.708).*

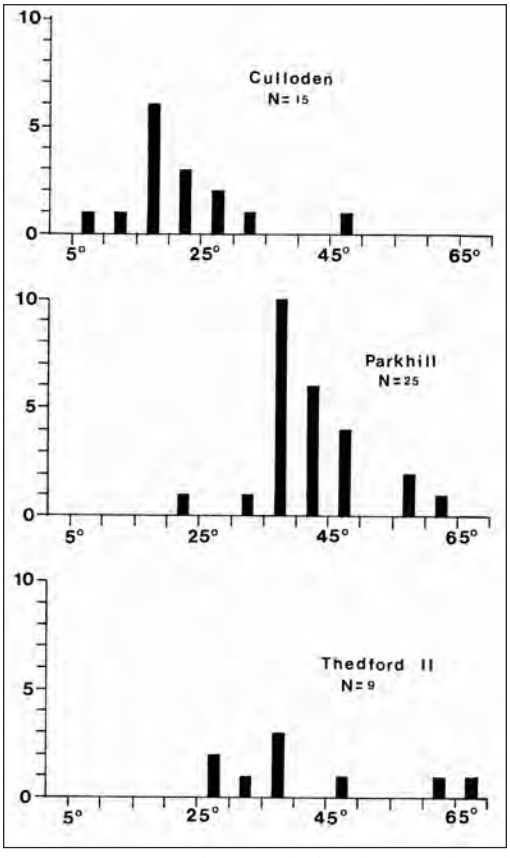


Figure 8. *Degree of trianguloid end scraper lateral edge expansion at the Culloden Acres, Thedford II, and Parkhill sites.*

Such items contrast with a more tapered variety seen at other sites, which lack hafting notches and which were apparently hafted in socketed handles (Rule and Evans 1985). In addition to the notching, the Culloden tools often (8 of 13, or 61.5%) also exhibit trimming at the proximal end to thin this area and fit the tool into the haft. It is notable that none of this trimming occurs on the flakes from biface cores, probably because they are relatively thin to begin with and have no need of such alteration. The most common method of proximal end trimming is to simply flake away the original blank platform and most of the bulb by small, steep, dorsal retouch flake removals. There are, however, two items that have a longer, more linear flake removal down the dorsal mid-line. In one case, this resembles a flute scar (Figure 5c). The "fluted" example is among the thickest in the trianguloid end scraper sample even after such thinning (10.2 mm thick; see Table 3). It is probably for this reason that it required the additional thinning.

Some items have spurs at one or both bit corners, which were probably produced by the encroachment of resharpened bit ends on lateral notch locations. Yet, in two or three cases the modifications to produce the spur seem to have been deliberate, given the nature of the flaking, including some ventral retouch (e.g., Figure 6c), but there is nothing in the use-wear results (see below) to suggest a deliberate use of these spurs. Spurs can also be produced by other means, such as accidentally by inexperienced knappers during resharpening (Weedman 2002). At least one other tool, a proximal fragment (Figure 5l), has a pronounced notch on one edge; this item represents a tool accessory produced via expediently recycling an exhausted or snapped example. Use-wear analyses also suggest that three other bit ends were recycled after having served their primary use.

As we explore more below, trianguloid end scrapers vary considerably in frequency at smaller Paleo sites or site areas. Despite the fact that they are often regarded as the most ubiquitous of all Paleo tools (e.g., Ruth 2013:123–124) and that they are often present in large quantities, as at Culloden Area A, at many other sites or areas they

are almost absent. We suggest that tool forms that vary in this manner are more likely to represent tools designed for tasks in very specific contexts, rather than multi-functional ones used in many contexts. If they were used in a wide range of tasks, we would expect them to consistently occur in substantial numbers at a wide variety of sites and certainly not to vary so much in relative frequency. The very large percentage at many sites indicates a specialized function.

In order to explore the context of just what the end scraper use context was, the tools were subjected to a use-wear study by John Tomenchuk (1994). In line with almost all of the ethnographic data on heavily resharpened end scraper use (e.g., Clark and Kurashina 1981; Gallagher 1977; Hayden 1979; Mason 1890), these items seem to have been used in hide processing/preparation. Such a conclusion is totally consistent with Tomenchuk's analyses of comparable tools from the Udora site in southwestern Ontario (Storck and Tomenchuk 1990:78) and with more recent, detailed analyses of these items at several other northeastern Paleo sites using high-power and low-power approaches (Loebel 2013; Miller 2014:296; Seeman et al. 2013; Singer 2017:38). The Culloden use-wear analysis specifically suggested an emphasis on the defleshing of hides, rather than the depilating and currying of the same (Tomenchuk 1994). The interpretation as hide-working tools is also consistent with the highly specialized nature of Area B (e.g., its dominance by trianguloid end scrapers). In essence, hide processing would be one of the few conceivable labour-intensive activities that would require large amounts of processing and produce a large number of tools in a short time (Hayden 1990), and that is more likely to have been carried out at a specialized site/site area due to the messy and odorous nature of the task. There are, of course, other labour-intensive activities that could be carried out by Paleo groups, simple butchering being a major alternative. Yet, such activities do not require tools thicker, blunter edges, such as end scrapers. Rather, they require sharper tool edges (Brink 1978:36).

As hinted above, the use-wear analysis also suggests that at least four of the end scrapers were used subsequent to hide working, and presumably spontaneously or expediently, in the ad hoc shaping and paring of antler items. Such use is indicated by the proximal end with a larger lateral notch (Figure 5l) and in the centre of the bits on three items (e.g., Figure 5a, j). Tomenchuk (1994) suggests that this ad hoc use involved refurbishing the antler flakers used to alter the edges of end scrapers. The intensive use of these scrapers as hide-processing items would require that they receive extensive and frequent resharpening of use-dulled edges. Similarly, alterations of the lateral and proximal edges may have been necessary in both new and broken items to facilitate their initial hafting, respectively re-hafting, in handles. More ad hoc use of the odd end scraper bit or lateral edge segment in other tasks involving wood or bone working has also been reported at several other sites (e.g., Loebel 2013:319–323; Miller 2014:297).

Retouched Flakes. A second well-represented tool class at Area A (19.4% excluding fragments) consists of seven specimens with irregular, sometimes almost serrated, working edges (Figures 6e and 9b-c; Table 4) and only "marginal" retouch (e.g., retouch which extends less than 2.5 mm back from the edge of the tool). The retouch is so short as to probably often be a product of the use of the tool edge rather than being purposefully created. Five tools are complete enough to determine the origin of the blanks used in their manufacture. In all cases, these items are made on flakes detached from block core forms; no examples of flakes from large biface cores are present. Moreover, three of these blanks have unflaked dorsal facets and another has a cortical platform, suggesting that they were mainly removed early in the sequence of core reduction. It is possible that these early stage reduction trimming and thinning flakes, as opposed to later-stage reduction flakes from standardized cores, such as the biface ones, were preferentially selected for these tools. Such simple tools do not require the more standardized blank shape desirable or necessary in the manufacture of more complex and hafted tools, such as end scrapers.

Of the five relatively complete tools, four

have been retouched along all or part of both lateral edges, while the remaining specimen has only been retouched along one lateral margin of the flake. Almost all of these edges are acute-angled (ca. 25–40°). Working edges on the acute-angled edges vary in plan outline, with five relatively straight in plan, four convex, and two somewhat irregular. The retouch is usually discontinuous or intermittent (10 of 11 edges), as opposed to continuous along the edge, and is predominantly bifacial (7 of 11 edges). The bifacial retouch on most, the acute working edge

Table 4. *Retouched Flakes from Area A, Culloden Acres.*

	Dimensions (mm)						
Cat. #	**Length**	**Width**	**Thickness**	**Retouched Edge Side**	**Edge Shape**	**Edge Angle***	**Retouch Type**
6	-	-	-	Left	Straight	30–45°	Discontinuous—bifacial
7	52.3	37.1	12.0	Right	Convex	25–40°	Discontinuous—unifacial
				Left	Straight	55–65°	Discontinuous—unifacial
10	46.5	26.3	6.9	Right	Irregular	20–35°	Discontinuous—unifacial
				Left	Irregular	25–35°	Discontinuous—unifacial
11/13	47.2	33.9	7.8	Right	Straight	35–50°	Discontinuous—bifacial
				Left	Straight	35–40°	Discontinuous—bifacial
15	-	-	-	Left	Convex	20–30°	Discontinuous—bifacial
18	40.9	30.7	8.8	Right	Straight	20–25°	Discontinuous—bifacial
				Left	Convex	30–50°	Continuous—bifacial
117	-	-	-	Right	Convex	20–30°	Discontinuous—bifacial
				Left	?	?	?

*Range of angles along bit edge has been rounded to nearest 5°.

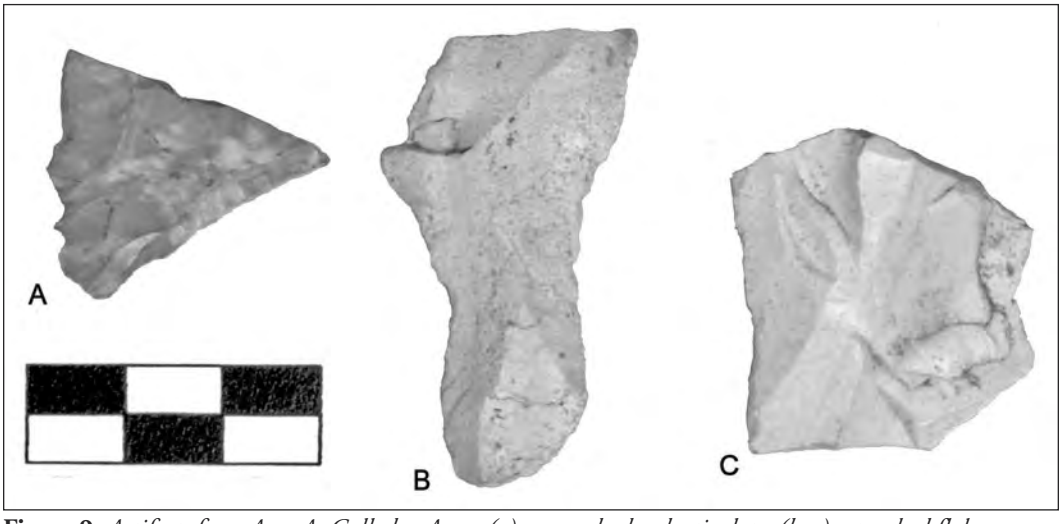


Figure 9. *Artifacts from Area A, Culloden Acres: (a) snapped-edge denticulate; (b, c) retouched flakes*

Table 5. *Other Tools from Culloden Acres.*

	Dimensions (mm)			
Type/cat. #	**Length**	**Width**	**Thickness**	**Comments**
Graver/8	36.2	29.8	6.4	Area A; 4 spurs, three worn down; all spurs produced by two edge normal unifacial retouch
Graver/83	25.2	21.1	3.2	Area A; single spurred; spur produced by two edge normal unifacial retouch
Double side scraper/114–142	60.2	26.7	8.8	Area A: Onondaga chert; left edge: concavo-convex (40–60°); right edge: convex (50–70°); some fine distal retouch
Snapped denticulate-cutter/19	-	28.1	3.8	Area A: Onondaga chert
Bipolar piece/131	40.9	19.2	10.7	Area A; sub-greywacke
Notch borer/ denticulate/17	-	40.0	3.2	Area A
Single concave side scraper/9	41.4	22.8	11.8	Area B; jasper; right edge: concave (80–85°)
Pièce esquillée/60	38.1	26.2	10.2	Area C

Note: Unless otherwise noted, all items are on Collingwood chert.

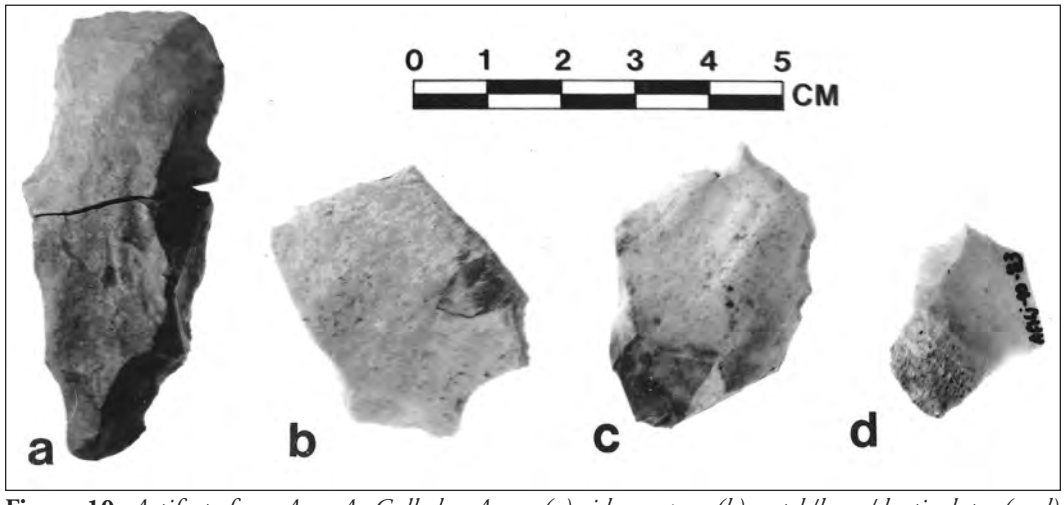


Figure 10. *Artifacts from Area A, Culloden Acres: (a) side scraper; (b) notch/borer/denticulate; (c, d) gravers/micro-piercers.*

angles, the sometimes irregular/rough edges, and a tendency for retouch scars to be somewhat oblique to the working edge suggest that these tools' working margins were used parallel to the direction of application or, phrased another way, in cutting tasks (see Frison and Bradley 1980:71; Lawrence 1979:118).

Other Tools. Also recovered from Area A were two micro-piercers or "gravers" (Table 5; Figure 10c-d). One of these items has four, often somewhat worn down, spurs, while the other has only a single spur. In all cases, the piercer margins are formed by a carefully applied diminutive unifacial retouch along both sides of the spur on the same dorsal flake face. These tools are made on the two biface thinning flakes used as tool blanks. The common use of these kinds of flakes as blanks for this tool form is reported at a number of other sites (e.g., Deller and Ellis 1984, 1992a:70; Maika 2012:126). There is no evidence at Area A for the reduction of items, such as point preforms, that would produce these thinning flakes. Therefore, the employment of these flakes as blanks for tools does not appear to simply represent expedient use of by-products knapped in place. Rather, it seems possible that the thinning flakes produced in point manufacture elsewhere were purposefully collected and curated to serve as tool blanks. This interpretation is supported by the presence of unmodified biface thinning flakes in a presumed tool kit cache at the nearby Crowfield site (Deller and Ellis 2011:126). Use-wear analyses of the Culloden examples suggest that they were used in graving soft to hard woods (Maika 2012:133).

The remaining tools are all unique items. One item on Onondaga chert (Figure 9a) is a snapped-edge denticulate or "cutter" (Gramly 1982:41). This rare but distinctive Paleo tool form has been reported from a number of Ontario sites (Deller and Ellis 2011:66; Ellis 2002: Figure 7j; Ellis and Deller 2000:129; Ellis and Poulton 2014:94; Jackson 1996: Figure 9e). These tools exhibit a thick, serrated edge formed by serially snapping small, adjacent, half-moon-shaped pieces along a margin. The Culloden case exhibits the cutter edge along one side margin. The opposite side margin has a steep (85–90°), unifacially retouched edge. It seems probable that rather than being intended as a working edge, this steep retouch was intended to provide a blunt backing to hold the tool.

The single example of a side scraper is also on Onondaga chert. It is a "double" form, being extensively (>2.5 mm back from the edge) and continuously retouched along both of the lateral edges (Figure 10a). One lateral margin is "concavo-convex" in outline, being convex in shape near one end and concave near the other, while the opposite side edge is convex in profile. As with most of the tools described above, it is made on a flake derived from the reduction of a block core.

Of the three other tools from Area A, one specimen is a characteristic Paleo tool form that has been recovered from a number of other sites we have examined, including Thedford II (Deller and Ellis 1992a:68), Parkhill (Ellis and Deller 2000:129), and Bolton (Deller and Ellis 1996). It falls within a combination tool class that incorporates spurs, notches, and denticulated edges on the same piece (Figure 10b). The present example has two spurs, one notch, and one denticulated edge. The spurs are somewhat atypical for this tool class in that they are relatively small compared with the pronounced and thick examples seen on these combination tools at other sites. In addition to the above working edges, this tool also incorporates a short, straight "scraper" edge at a distal margin. Again, this tool is made on a flake detached from a blocky to tabular core form.

Another tool is a somewhat fragmentary, heat-fractured *pièce esquillée*, also on a high-quality Onondaga chert (Figure 11a). Given that it is made on this chert, this item may be associated with the Early Archaic bifurcate component rather than the Paleo component at Area A. We use the term *pièce esquillée* here in a purely descriptive, non-functional sense (e.g., scaled piece), as it has the "scalar" overlapping marginal scars. As noted above, a second example of this artifact form was also recovered from the surface of Area C (Figures 6d and 11b). *Pièce esquillée* have been variously interpreted as bipolar cores or wedges (cf. LeBlanc 1992; Shott 1999). The present examples seem

doubtful as bipolar cores using the criteria employed by Hayden (1980) to differentiate between cores and wedges. For one thing, both artifacts are made on thin flakes that would not produce flakes of any consequence to serve as tool blanks. Moreover, the preserved flake scars resulting from battering are relatively small, and we believe that little use could be made of such tiny flakes. Hence, as with examples we have recovered from other sites, we see these items as wedges used to split wood or bone.

The last tool, on sub-greywacke, is classified here simply as a bipolar piece (Figure 11c). Although it has been bipolarly used, it does not exhibit the "scalar" scars characteristic of *pièce esquillée*, perhaps due to the nature of the raw material. At one end, the item is highly polished and rounded by use, suggesting a wedging/slotting function. There are few published references to such tools, but almost identical items and or simple bipolar pieces also made on coarser-grained rocks, have been recovered from the Early Paleo Gainey site in Michigan (Donald B. Simons: personal communication, 1990) and the Late Paleo Fowler site in southcentral Ontario (Woodley 2004). It is on this basis, as well as the fact it was recovered from a probable feature (Feature 2; see below), that we assign it to the Paleo occupation.

Flaking Debris. A total of 388 pieces of flaking debris are assigned to the Paleo component at Area A (Table 2). Of this total, most (365, or 94.1%) are on Collingwood chert and only a small number are on Onondaga chert. Besides flakes on these two cherts, the Paleo debris includes six sub-greywacke flake or flake fragments and one small quartz flake. The recovered sub-greywacke flakes are assumed to be related to the Paleo component because of the bipolar item on this material described above. The quartz flake is assigned to the Paleo component because it was recovered from a definite Paleo feature (Feature 3). Two other quartz flakes were also recovered in the excavations. However, both were recovered from the isolated 50 × 50 cm units excavated into the woods north of the main excavated area. Since there is no evidence of Paleo occupation in the area tested, we assume, perhaps erroneously, that those two flakes are not Paleo associated.

The 381 chert waste flakes from Area A are notable in that they are all of a very tiny size. For example, the chert waste flakes only weigh 0.05 gm on average (Table 2). Indeed, the largest chert flake recovered weighed 0.38 gm, and only four of the waste flakes weighed more than 0.20 gm. The small size of this debris can also be appreciated if one considers that of the 211 chert flakes from the ploughzone, 79.1 percent were

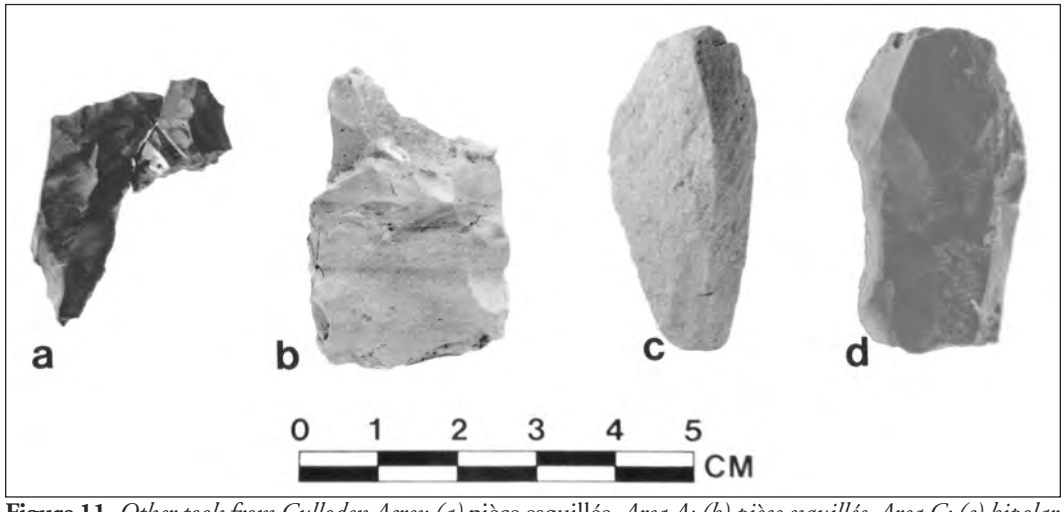


Figure 11. *Other tools from Culloden Acres: (a)* pièce esquillée*, Area A; (b) pièce esquillée, Area C; (c) bipolar piece on sub-greywacke, Area A; (d) concave side scraper, Area B.*

recovered in 3.2 mm mesh, despite the fact this mesh size was used in only 25 percent of the excavated area. In the absence of the use of 3.2 mm mesh, few waste flakes would have been recovered and their usefulness in isolating activity areas (e.g., in constructing density diagrams and isolating artifact clusters) would have been severely limited. As an extreme example, in one unit, the three one-metre subsquares passed through 6.4 mm failed to yield any Paleo waste flakes, but 23 such flakes were recovered from the single one-metre subsquare where 3.2 mm mesh was employed. These contrasts illustrate well the problems in locating and assessing comparable uniface-dominated Paleo sites if one were to simply use 6.4 mm mesh to screen test units.

Excluding a residual category of flake fragments too incomplete to assign to type, all of the chert waste flakes can be placed into two types: biface finishing flakes and uniface (scraper) retouch flakes. The biface finishing flakes are roughly parallel-sided in plan and may have resulted either from the last stages of biface manufacture (edge regularization and shaping) or from biface edge rejuvenation. Their striking platforms are acute-angled, ground, and faceted, and often lens-shaped in plan view. They also exhibit slight longitudinal curvature in profile and, often, bidirectional scars, all of which betray their removal from biface edges.

The uniface retouch debris includes tiny flakes, mainly from tool edge rejuvenation, that exhibit obtuse-angled, generally flat, relatively small platforms with circular plan outlines. Adjacent to the platforms on the dorsal surface, they almost always exhibit tiny hinge-/step-terminated flake scars, which possibly result partially from the use of the tool edge prior to resharpening (Frison 1968). It is probable that most of these flakes were removed during the retouching of end scraper bits. An origin mostly in end scraper alteration seems most plausible. The flake scars on other unifaces, such as retouched flakes/denticulates and the micro-piercers, indicate that these flakes would be so small as to be impossible to recover, even in 3.2 mm mesh screen. Moreover, almost all of the uniface retouch flakes retain, at their distal end, a segment of the old juncture of the former bevelled face of the tool and the flake blank's dorsal surface. These junctures are quite abrupt, almost right-angled, and well defined. The junctures indicate flake removal from heavily retouched, steeply bevelled edges characteristic of trianguloid end scraper bits but not of the vast majority of other Paleo unifacial tools—and certainly not of the other tool forms recovered from the Culloden site. Moreover, the right-angled nature of the bevelled edge and back portions of the old tool edges seen on these flakes are characteristic of steeply retouched edges. This characteristic suggests that they are a product of resharpening rather than manufacture and that the end scrapers were actually being used on the site rather than just discarded there. On unifacial tools, we should expect the earlier flakes, such as those derived from manufacture of tool edges, to be from relatively acute edges and to have acute junctures. However, as the edge is reduced through unifacial resharpening, edges will become steeper and more right-angled. Despite extensive efforts, we were not able to refit any of the uniface retouch flakes with the scars on end scrapers from the area.

The ability to assign all relatively complete waste flakes to the reduction of specific tool classes (which is only possible for material produced in later stages of lithic reduction), combined with the small size of all the recovered flakes, clearly indicates that core reduction was not carried out on the site. Given the dominance of uniface retouch flakes (Table 2), we conclude that activities were restricted mostly to edge rejuvenation. One might attribute the lack of core reduction activities to the obviously specialized nature of the site. However, it is worth noting that we do not know of any site located more than 35 km from the main chert source employed where there is evidence of core reduction. Paleo knappers in the area, as a rule, only transported mostly finished or almost finished tools to locations of tool use, probably to avoid the unnecessary transport over long distances of material that will simply be trimmed off and discarded as waste (Ellis 1979, 1984, 1993). Hence, the absence of core reduction activities is a product of more basic factors, specifically, advance planning on the part

of Paleo knappers, rather than a product of site-situational variation in activity.

Among the Collingwood debris, uniface retouch flakes outnumber biface finishing flakes by a wide margin, making up 96.8 percent of the debris assignable to either tool class. Their frequency clearly shows the predominance of uniface-related activities at the area. This conclusion is in line with the fact all the recovered tools on this material are unifaces. The focus on uniface reduction is emphasized even more if we consider that the reduction of a single biface produces much more debris than simple uniface resharpening (Collins 1975:32) and that biface reduction flakes are generally larger than the uniface retouch flakes and thus more readily recovered. Hence, the production of so many uniface retouch flakes vs. biface reduction flakes at the area indicates a very heavy emphasis on the reduction of the uniface tools. Indeed, we have seen no excavated site or site area assemblage in southwestern Ontario that has produced so few biface flakes in comparison to uniface flakes, or even as dense a concentration of such uniface retouch flakes, as is evident at Culloden Area A. However, comparable sites have been reported from the Rice Lake area in southcentral Ontario (Jackson 1994, 1998).

The few high-quality Onondaga chert flakes recovered include only six items assignable to biface or uniface reduction, which is not a statistically valid sample. The biface finishing flakes outnumber the uniface retouch flakes, a direct contrast with the Collingwood waste flakes (Table 2). It is possible, therefore, that many of these Onondaga flakes are not, in fact, associated with the Paleo component, especially since the recovered later diagnostic from the area on that material, the bifurcate-based point Figure 4a), is a biface.

As for the debris on non-siliceous materials, the quartz flake is simply a tiny flake fragment recovered from Feature 3. The six sub-greywacke items all consist of relatively large flake fragments that lack platforms but do not seem to be from biface reduction. It is probable that such material was obtained locally, as it is common in tills and other secondary deposits in the area, for example in the Thames River valley to the south. Some of these sub-greywacke items may actually be simple flake tools rather than waste. It can be difficult to distinguish between these categories because the material is not very amenable to readily identifying purposeful retouch or "wear," especially if the items were only briefly and lightly used before discard. Although use of sub-greywacke is very rare on Paleo sites in southwestern Ontario, it has been reported from some Paleo sites, notably Thedford II (Deller and Ellis 1992a:79), and seems to have been used primarily expediently, to produce a few simple tools.

Paleo Features

During the Area A excavations, two candidates for Paleo features, or rather, feature remnants, were encountered, which were labelled Features 2 and 3. These features lacked visible outlines in the subsoil (i.e., they were "ghost features") and were recognized simply on the basis of concentrations of lithic debris. Undoubted features lacking such outlines have been reported from other sites in Ontario, notably Crowfield (Deller and Ellis 2011) and Udora (Storck and Tomenchuk 1994). We have suggested that the lack of outlines visible to the naked eye is simply a combined product of the age of these features and leaching due to normal, ongoing soil formation processes (Deller and Ellis 1992a:93).

Feature 2 is the more poorly defined of the two features. It consists of a scattering of debris in the northeast and southeast one-metre subsquares of square 404N/420E (Figure 12). Four tools, including the sub-greywacke bipolar piece, one fragment of the Onondaga double side scraper, and two Collingwood chert trianguloid end scrapers, were recovered up to a 4.5 cm depth into the subsoil. The two trianguloid end scrapers were recovered close together, with one lying almost on top of the second. These end scrapers are very similar in size, raw material characteristics, and morphology. It is possible, therefore, that they were made and used by the same knapper and perhaps were manufactured on two flakes removed from the same core. In addition to the end scrapers, another end scraper and a Collingwood chert tool fragment were also recovered from the

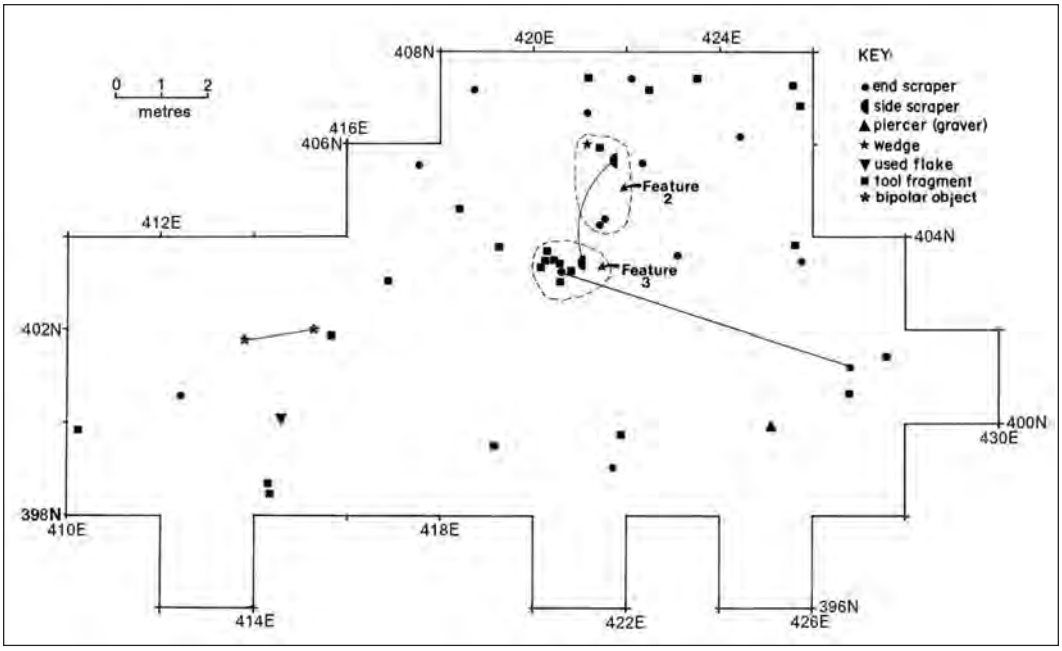


Figure 12. *Feature and artifact distributions in Area C, Culloden Acres.*

ploughzone, almost immediately above the subsoil concentration. Eight Collingwood chert waste flakes were also recovered from the subsoil, four uniface retouch flakes and four small flake fragments. Excepting the side scraper fragment, none of the artifactual debris from the presumed feature yielded any evidence that it had been heated.

The second feature, Feature 3, is much better defined and is undoubtedly a feature remnant. It was situated just to the west of centre in square 402N/420E (Figure 12). The feature yielded five Collingwood chert tool fragments, of which only one, the proximal half of a trianguloid end scraper, could be identified to type. This distal or bit end (Figure 5d) was recovered in the ploughzone of square 400N/426E, to the southeast of the feature. The waste flakes consisted of a dense concentration of 159 items, comprising 70 Collingwood and 1 Onondaga uniface retouch flakes, as well as 88 flake fragments, including 86 on Collingwood chert, 1 on Onondaga chert, and 1 on quartz. None of the subsoil debris had been heated. Except for a very few tiny waste flakes, which were missed during subsoil trowelling and subsequently recovered in the 3.2mm screen, all the subsoil feature material was piece-plotted in three dimensions. In plan, plotting of these items revealed a dense, roughly circular concentration of material, measuring some 100 cm north to south by 110 cm east to west (Figure 13). While 22 flakes were recovered from a root disturbance partially undercutting the feature on its northwest side, none of the other flakes were in any visible subsoil disturbance. Plotting of the subsoil items so they can be viewed in both north–south and east–west profiles reveals that the feature had a regular, shallow basin profile that extended some 25 to 30 cm into the subsoil (Figure 14).

The nature and function of such features are unknown. The lack of heating suggests that they were not hearths or root burns (and the latter interpretation is excluded based on other characteristics too). The dense concentrations of debris, at least in Feature 3, may suggest that it served simply as a debris dump. The dense concentration of debris in this feature in contrast to ploughzone finds may be due to the careful excavation and trowelling of the subsoil but the feature location does correspond to a relatively

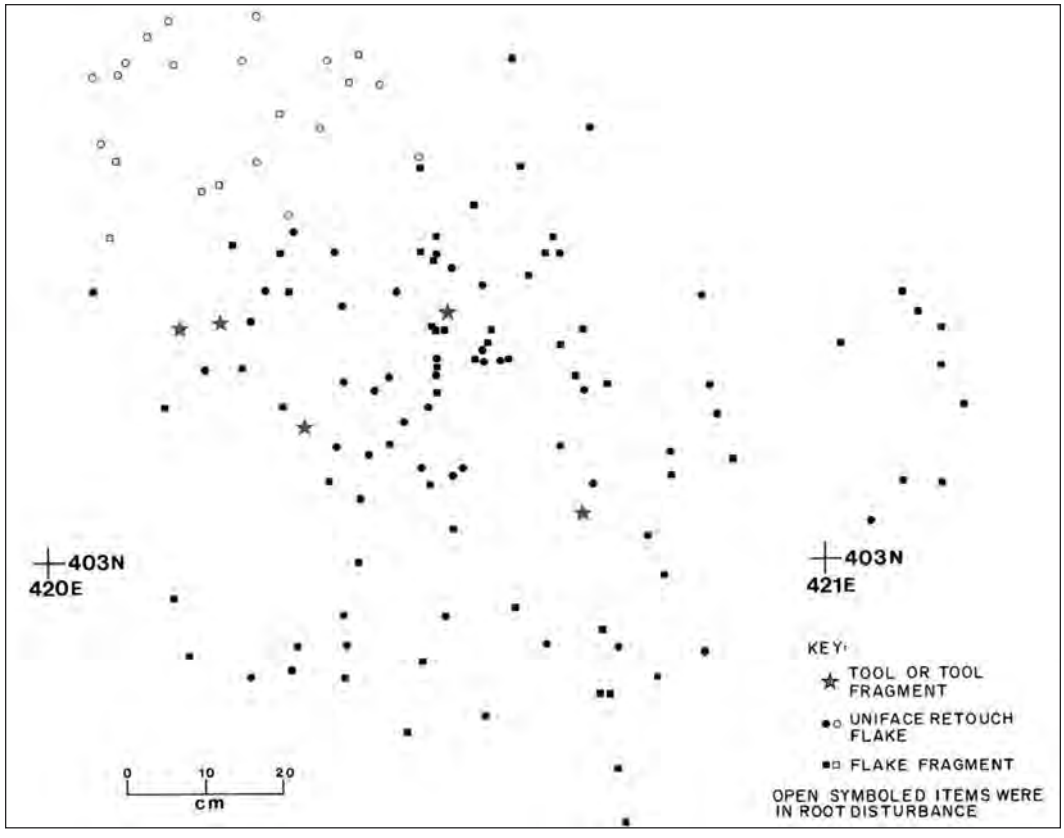


Figure 13. *Plan of piece-plotted items defining Feature 3, Culloden Acres.*

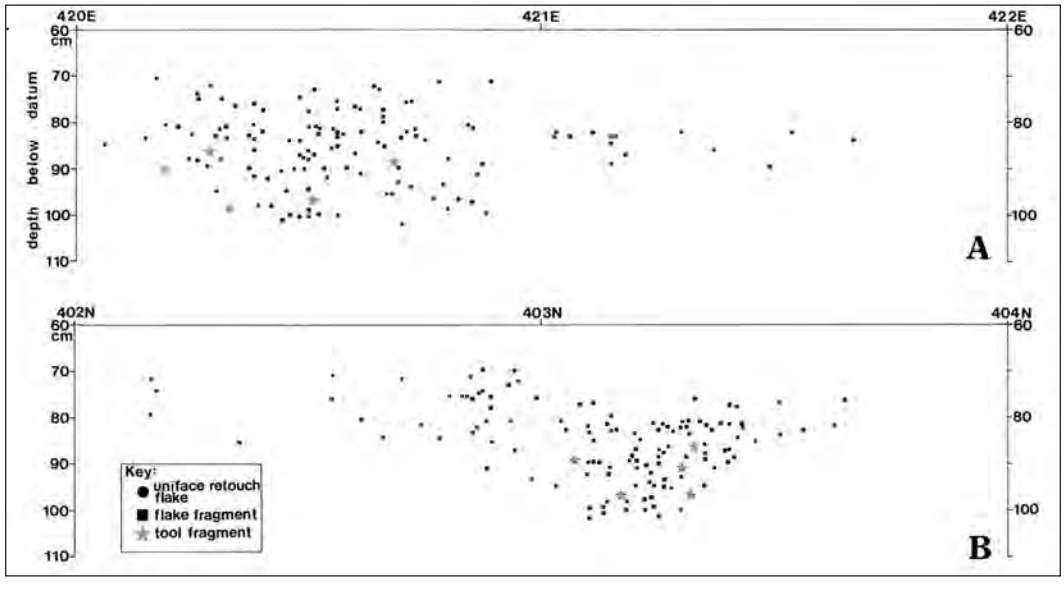


Figure 14. *Profile/back plots of artifact finds from Feature 3, Culloden Acres: (a) West (left) to East (right) profile; (b) South (left) to North (right) profile*

dense concentration of ploughzone tools/debris (see below). What seem to be similar dumps, albeit on the surface, such that they were characterized as "clean-up debris piles," are reported from the unploughed Shawnee Minisink site in Pennsylvania (Gingerich 2013:236–237). Regardless of its function, Feature 3 may represent a form typical of small sites dominated by uniface and, particularly, trianguloid end scraper activities. For example, two almost identical features are reported from the Halstead site in southcentral Ontario (Features 3 and 4; see Jackson 1994). As

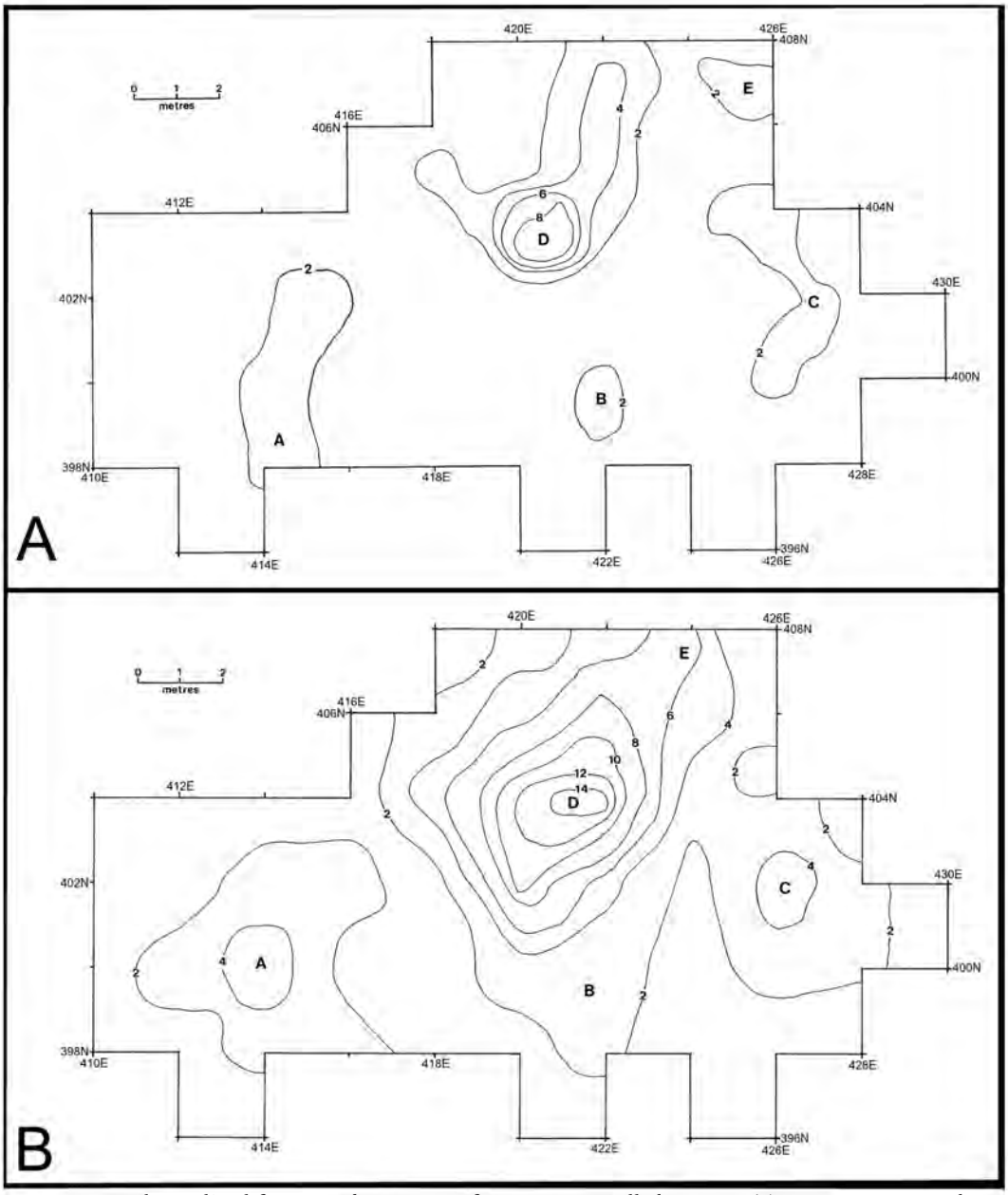


Figure 15. *Paleo tool/tool fragment density maps from Area A, Culloden Acres: (a) counting items within a 1 m radius of grid plots; (b) counting items within a 2 m radius of grid plots.*

with Culloden Feature 3, these Halstead features were approximately the same size in plan and depth, had roughly oval outlines, and included dense concentrations of uniface retouch flakes and a few scraper fragments.

Spatial Distribution

The actual distribution of Paleo tools and tool fragments within Area A is shown in Figure 12. Density maps of such items using a "moving template" (Whallon 1984:228) were constructed by counting all items within a consistent, specified distance of particular, evenly spaced points on the grid system. Then density contours were drawn linking the points having the same density of artifacts. Two maps are shown here: one with counts at 1 m radii around grid points and one at 2 m radii (Figure 15). Because isolated artifacts can be moved about within the soil matrix, resulting in some distortion, we have plotted density contours only for two artifacts or above. The two plots suggest four or five clusters of material, which we have labelled A to E for convenience. The reality of the suggested clusters can be further evaluated by looking at densities of the waste flakes recovered from the ploughzone (e.g., excluding the material from Features 2 and 3). Figure 16 plots all of the Collingwood chert debris from the area by two-metre excavation unit. The high-quality Onondaga chert and sub-greywacke ploughzone flakes are omitted from the debris plot, but their addition to the density map does not alter the relative densities seen in Figure 16.

Both the tool 1 m radii plots and the flaking debris plots suggest that there is one larger, very dense, central cluster surrounded by smaller, less dense, peripheral clusters. However, the waste flake cluster corresponding to tool cluster "E" is relatively dense, and it is very possible that the tool densities in this area are depressed or that "E" is simply an extension of "D" in the tool plots. Essentially, the plotting method underestimates tool densities in marginal areas of the grid; there could be more tools just outside the excavated area, but they are not counted. Such an extension is also suggested by the 2 m radius plots, where "E" is not as distinct from "D" (Figure 15b). We stress as well that tool densities are also underestimated in the southern portion of the grid, because artifacts that had not been piece-plotted were removed by surface collecting, whereas the northern part of the grid was unploughed at the time of our investigations. Assuming that the surface-collected tools (n = 16) and debris (n = 25) were equally recovered from

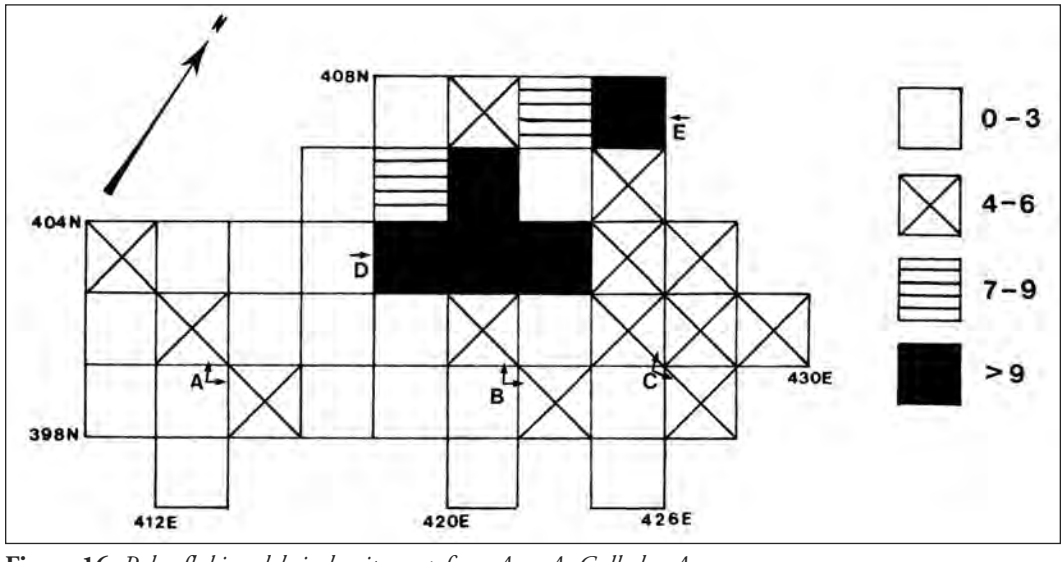


Figure 16. *Paleo flaking debris density map from Area A, Culloden Acres.*

each of these three clusters of material in that area, they may have had densities closer to that of the clusters in the previously but not currently ploughed northern area of the grid. It is even possible that the area overall had one single concentration with a denser centre.

Based on the present evidence, it may be best to regard Area A as simply one cluster or as being composed of several clusters of raw material of relatively equal size and density. However, features can only be associated with cluster D, not with the other concentrations of material, and this cluster may be larger and extend to the northeast. The dense concentration of debris and tools in the feature areas and their possible interpretation as debris dumps also raises the possibility that most of the ploughzone items from the central area may actually have been in such features prior to ploughing. We have no way of evaluating that idea but if so, housekeeping is indicated, invalidating the idea that a smaller site such as this would witness little housekeeping activity. Regardless, most clusters seem to have witnessed end scraper use or at least discard and resharpening of the same, as indicated by the debris recovered.

While the high percentage of scrapers suggests a specialized activity focus, there is at least one suggestion of spatial variation in those activities, notably in the retouched/denticulated flake distributions. Only one such item was recovered in excavation, namely, from the currently ploughed field area. Since all the other examples of this tool form were also recovered from the ploughed field in surface collection, these tools seem exclusively associated with the potential clusters in the southern edge of the area and not with those to the north. It is possible that the more central cluster with the features was an area for debris clean-up and possibly tool maintenance, such as end scraper removal from and replacement in hafts, while the more peripheral clusters represent actual tool use locations, where unhafted tools, such as the retouched flakes, were discarded right after use.

Area B

Area B (Figure 3) was initially recognized as a locus of Paleo activity simply because of the surface recovery of Collingwood chert debris, including mainly biface reduction flakes. Subsequently, our surface collections recovered a segment of a channel flake derived in point fluting, confirming a locus of early site use. Because the area had some evidence of point manufacture, it was decided to test it, largely in the hope of recovering at least one fluted biface whose morphology would help us to place the Culloden site into the suggested lower Great Lakes fluted point phases, and in the hope that this area could provide an activity contrast with the uniface-dominated Area A and, hence, clues as to how the occupants may have spatially organized activities at the site. Surface finds and higher densities of items in marginal areas of the excavated area suggest that the Area B Paleo component extends slightly to the west, north, and east. It covers some 80 m^2, of which we were able to excavate 56 m^2.

As at Area A, there were no suggestions prior to the project of the presence of later components at Area B. However, we subsequently recovered a trace of Middle Woodland use and a more substantial, but still relatively ephemeral, Early Archaic Corner-Notched horizon component. The latter included tools on a more mottled, lower-quality Onondaga chert variant, as well as on Kettle Point chert and has been described in detail elsewhere (Ellis and Deller 1991a). Consideration of raw materials used, their spatial distributions, and a thorough knowledge of diagnostic unifaces as well as bifaces assisted in sorting out the material associated with each component (Deller and Ellis 1991b).

Evidence of Paleo activity at Area B consists solely of lithic tools and debris. There was no evidence of Paleo features in the area, although a shallow Middle Woodland feature (Feature 4) at the south end contained a large, notched/expanding stemmed point. This item falls within the range of variation of Vanport-type points, and as is often the case with points of that type, it is made of Flint Ridge chalcedony, which outcrops in Ohio (see Spence et al. 1990:145). In

direct contrast to Area A, Area B was used almost exclusively in Paleo times for biface-related activities, specifically for fluted point manufacture. The definite Paleo material from Area B is on two stone raw materials: Collingwood chert and a high-quality, dark yellowish brown material (10YR 5/4 in the Munsell colour coding system), which is jasper from an extra-provincial source. The recovery of channel flakes on both of these materials at Area B that derive from fluting leaves no doubt as to their Paleo association.

Only two tools can be associated with the Paleo component. One is a fragment of a uniface on Collingwood chert, recovered from square 370N/406E (northeast one-metre subsquare). The other was recovered in surface collection and consists of a single concave side scraper definitely on jasper (Figure 11d; Table 5), the nearest sources of which are in Pennsylvania, at least 300 km away. These items are often referred to as spokeshaves or drawshaves in the Paleo literature and clearly seem to have served in working cylindrical objects, such as spear or dart shafts. The recovery of such an item in what is a specialized fluted projectile manufacture area at Culloden would be consistent with such an interpretation, although it must be emphasized that such concave scrapers can also occur in areas where none of the recovered materials seemingly have anything to do with projectile manufacture/repair. An example is the Onondaga side scraper with a concave working edge along part of one margin recovered from Area A (for other examples, see Stewart 1997:181). However, it is possible that the concave side scraper from Area A was used in shaving antler flakers, as is suggested for the recycled end scrapers from the same area.

As for the Paleo flaking debris, 161 items are definitely assignable to this component at Area B. These comprise 155 flakes on Collingwood chert and 6 on probable jasper (Table 6). All of the Area

Table 6. *Paleo Waste Flake Counts and Weights from Area B, Culloden Acres.*

	Chert Type		
Debris type/class	**Collingwood**	**Exotic (Jasper?)**	**Total**
Channel flake (mean weight = 0.30 gm)	8 (88.9%) [2.09 gm]	1 (11.1%) [0.19 gm]	9 (100.0%) [2.28 gm]
Biface thinning flake (mean weight = 0.33 gm)	9 (90.0%) [2.85 gm]	1 (10.0%) [0.42 gm]	10 (100.0%) [3.27 gm]
Biface finishing flake (mean weight = 0.09 gm)	43 (93.5%) [3.82 gm]	3 (6.5%) [0.43 gm]	46 (100.0%) [4.30 gm]
Biface reduction error flake (mean weight = 0.14 gm)	2 (100.0%) [0.27 gm]	-	2 (100.0%) [0.27 gm]
Uniface retouch flake (mean weight = 0.15 gm)	7 (100.0%) [1.04 gm]	-	7 (100.0%) [1.04 gm]
Fragment (mean weight = 0.08 gm)	86 (98.9%) [6.91 gm]	1 (1.2%) [0.05 gm]	87 (100.1%) [6.96 gm]
Total (mean weight = 0.11 gm)	155 (96.3%) [16.98 gm]	6 (3.7%) [1.09 gm]	161 (100.0%) [18.07 gm]

Note: Numbers in brackets represent the total weight of all items in that type/category.

B flakes are quite tiny, with only 13 flakes weighing more than 0.20 grams and none weighing more than 0.75 gm. The small size of the flakes is also indicated by the fact that 51.2 percent of the debris was recovered in the 3.2 mm mesh, even though this mesh size was used on only 25 percent of the excavated matrix. The percentage recovered in the 3.2 mm mesh is lower than that at Area A, and on average, the waste flakes from Area B are larger than those at Area A (0.11 gm vs. 0.05 gm average). This difference can be attributed to the emphasis on biface reduction at Area B, in contrast to the emphasis on uniface reduction at Area A; biface reduction flakes tend to be larger. Indeed, at Area B, biface reduction flakes make up 90.4 percent of the debris assignable to biface or uniface reduction, whereas at Area A, these flakes made up only 3.2 percent of such debris. Overall, the small size of the debris, the ability to assign all flakes retaining platforms to biface or uniface reduction, and the absence of cores per se indicates that lithic reduction activities were restricted to the later stages of tool manufacture and to edge rejuvenation or resharpening.

Figure 17. *Channel flakes from Area B, Culloden Acres.*

The biface debris from Area B can be placed into four types. All of these types have acute-angled, ground, and faceted platforms, betraying their removal from bifacially worked artifact edges. Most notable are the nine channel flakes, or rather fragments thereof, which indicate that fluted bifaces were manufactured in the area (Figure 17). These occur predominantly on Collingwood chert (Table 6), but, as noted above, one item is on jasper (Figure 17d). Channel flakes are distinguished by a roughly parallel-sided outline; a plano-convex cross-section, a lack of longitudinal curvature; the presence of dorsal scars oriented at right-angles to the longitudinal flake axis; and, when present, a platform that is isolated as well as ground and faceted. Six of the flakes, all on Collingwood chert, retain such platforms, while the remainder are medial or distal segments. It is also notable that only one of the channel flakes (11.1%), a proximal or platform end, exhibits a parallel dorsal scar indicating that it was the second channel flake removed from the face of a preform.

Excluding the single "secondary" channel flake proximal end, and assuming one flute per face, the five remaining proximal ends suggest that at least three Collingwood chert bifaces were fluted at Area B. Moreover, the one channel flake on probable jasper suggests that an additional point on that material was also fluted at the area. Of the total channel flake sample, only five segments are complete enough to determine maximum width of the flakes. These flakes range from 11.3 to 16.4 mm wide, with a mean of 12.9 mm.

The other biface flake types recovered from Area B include the following: relatively large, broad, and expanding biface thinning flakes derived during the thinning stage of preform reduction (see Deller and Ellis 1992a:80–81); smaller, more parallel-sided to only slightly expanding biface finishing flakes derived primarily from the final stages of biface reduction (margin regularization and outline shaping) as well as probably edge rejuvenation; and what are referred to here as biface reduction errors. The last-named are short, abrupt flakes with very large platforms. They have been recognized at other Paleo sites

(Deller and Ellis 1992a:86) and seem to result from improperly prepared platforms; during flake detachment, the biface edge collapses, producing a concavity, or edge "bite," on the preform.

The remaining flakes consist solely of uniface retouch flakes and a number of flake fragments. The distribution of these and other Paleo flakes at Area B is shown in Figure 18. Except for a tendency for this material, including all the channel flakes, to concentrate more in the northern part of the excavated area, little patterning is evident in this overall distribution or in that of other individual debris types (Deller and Ellis 1991b).

Paleo Cultural/Phase Affiliation

Culloden has not yielded any fluted bifaces, so assignment to any defined fluted point complex/phase is not straightforward. At the time of the field investigations, we were impressed with certain characteristics of the assemblage, such as evidence of use of southern exotic Upper Mercer chert, as well as the size and morphology of items, such as the end scrapers. These aspects led us to strongly suspect an association with the earlier use of the region by groups making generally larger, more parallel-sided fluted points. At that time, the earliest forms were often assigned to a Gainey type that preceded later types, with side edges that expanded from the base, such as Barnes (Parkhill phase) and Crowfield (Deller and Ellis 1988, 1992a; Ellis and Deller 1990). Other sites with pre-Gainey slightly expanding to parallel to contracting-sided forms, referred to by the terms Clovis, Enterline, or Remington, had been suggested in surrounding areas (e.g., Brose 1994; Roosa 1965; Witthoft 1952), but no definitive sites had been documented in Ontario or Michigan. Hence, we suspected initially that Culloden was most likely a Gainey phase site.

However, recent research at the Rogers site in Ontario (Deller et al. 2018; Ellis and Lothrop 2019) and the Palmer site in Michigan (LaDuke and Wright 2018), among others, clearly documents the presence of another, much more Clovis-like biface form, presumed to be earlier than Gainey, that is comparable to those from sites in surrounding geographic areas (Table 7). As with Clovis bifaces, points from such sites as Rogers are thicker and wider, have shallower basal concavities, tend to be more often multiple fluted, and are very short fluted compared with those of the Gainey type (Ellis 2019; Ellis and Lothrop 2019). Related to the short fluting, they lack other features of Gainey and subsequent Barnes points. Notable at these sites is a lack of smaller-sized, refined, more patterned lateral surface flaking to produce a well-defined medial ridge that facilitates longer flute removals. They also do not have flute removal striking platforms that are lined up in side profile with the face to be fluted, a procedure that allows force to be directed more straight up the biface and results in longer flute removals (see Bradley et al. 2010:100–101). Rather, the platforms are more centred in profile, such that force is directed more diagonally away from the

Table 7. *Suggested Fluted Point Sequence and Age.*

Age (years ago)	Complex/Phase/Point Form
12,800	Clovis-like
12,400	Gainey
12,000	Parkhill (Barnes points)
11,600	Crowfield

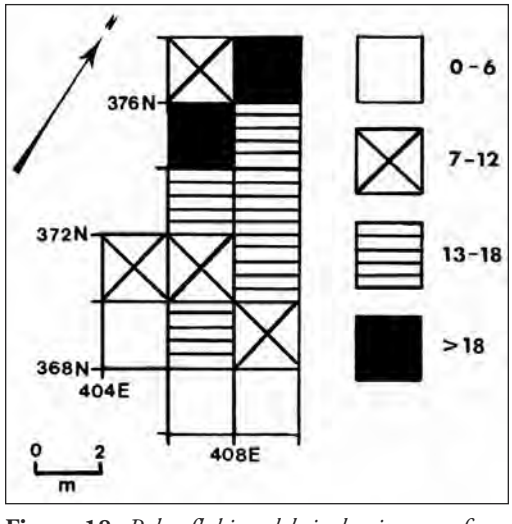


Figure 18. *Paleo flaking debris density map from Area B, Culloden Acres.*

face of the biface, resulting in shorter flutes. Also, fluting platforms are partially isolated in a substantial number of examples by the previous removal of two substantial, shorter guide flutes (Deller et al. 2018; Witthoft 1952).

Turning to Culloden, several attributes of the channel flakes do suggest a Gainey phase affiliation. Characteristics of Gainey and Barnes points, such as the longer flutes; the better, well-isolated platforms; and the refined dorsal point flaking, make channel flakes easier to identify on such sites and separate them out from simple end biface thinning flakes, something not easy to do on the sites most closely resembling Clovis, such as Rogers (Deller and Ellis 2018:122–123). The channel flakes from Culloden are easily recognized; come from mostly single fluted bifaces; do not have any evidence of guide flutes; and have dorsal surfaces indicating refined, smaller lateral flake removals to create medial ridges.[3] Also, in side profile, retained platforms line up well with the body of the channel flake, suggesting that the platforms were more in line with the face to be fluted.

In terms of comparisons with Parkhill phase Barnes points, Shott (1990) has demonstrated that flute surfaces are wider on Gainey points than on the Barnes examples. Jackson (1996:30–31) carried out comparisons of Culloden along with other Gainey phase samples and Parkhill phase samples and showed that the greater width of the channel flakes suggests that Culloden is a Gainey phase site. In this regard, it is notable that the widest example in the very small Culloden Area B sample, at 16.8 mm, is wider than any of the more than 110 such items where maximum width is measurable recovered from the Parkhill phase Thedford II and Parkhill sites. We note, however, that the overall differences between the measurements that we carried out on the Culloden and the Thedford II and Parkhill assemblages are not statistically significant. Also consistent with a Gainey or earlier affiliation is the presence of southern-derived Upper Mercer chert and jasper artifacts at Culloden, in combination with Collingwood chert artifacts, something not seen on Parkhill phase sites. Conversely, there is an absence of northern Michigan Bayport chert at Culloden, a material often seen on Parkhill phase sites. Yet, we readily admit that the absence of Bayport chert could be a product of sampling error. Even the use of quartz (and quartz crystal) seems to be something seen more on earlier sites with more parallel-sided points (Ellis 2015).

There is a high percentage of channel flakes with platform ends (66%) at Culloden. In contrast, at sites with Barnes points, such as Thedford II (Deller and Ellis 1992a:84), only 34.2 percent (14 of 41) are platform ends, while at Parkhill Area B 25.9 percent (35 of 135) and at Parkhill Area C 40 percent (16 of 40) are (Ellis and Payne 1995). As channel flakes tend to collapse in removal, one would expect many more channel flake segments lacking platforms to be produced on points of that type as opposed to points where shorter fluting was the norm (Wortner and Ellis 1993). Of course, it is possible that Gainey points as a whole, despite being well fluted, had shorter fluting on average than Barnes points and that therefore channel flake platforms would be more frequent in Gainey assemblages. We need better-reported samples to confirm such a judgment. Certainly, the Barnes points from a cache at the Thedford II site, Ontario, have much longer flutes on average than those Gainey points in a cache at the Lamb site, New York (Ellis and Lothrop 2019).

Overall, and despite some ambiguity, the channel flake evidence more consistently favours a Gainey rather than a Parkhill phase affiliation. Yet, there is other evidence we can use to argue for a Gainey phase assignment, notably the end scrapers. Lancashire (2001) carried out comparisons of

[3] For the record, the well-defined medial ridges, the relatively wide nature of the recovered channel flakes, and the rarity of multiple fluting strongly indicate that the Culloden examples are not from Crowfield-type points. For example, at the Crowfield phase Bolton site (Deller and Ellis 1996), 22 of 31 (or 71%) of the channel flakes exhibit dorsal scars indicating they are from multiple fluted points. Similarly, at the Crowfield phase Alder Creek site, 8 of 9 (or 88.9%) are secondary channel flakes (Timmins 1994:179).

trianguloid end scraper samples from various Gainey phase sites and Parkhill phase sites and found that the samples were quite different; the Culloden examples were statistically aligned with the earlier phase material. At the time, Lancashire did not have available or include samples from sites that were more Clovis-like, such as Rogers, in Ontario; Shoop, in Pennsylvania; or Palmer, in Michigan. We were able to collect data on some variables for those other assemblages. Ignoring Culloden for the moment, as shown in Figure 19, the more Clovis-like and Gainey samples, as a whole, are predominantly much shorter and narrower, with more steeply retouched bits. They also tend to have flatter bits, as measured by shallower bit depths and bit width–depth ratios that indicate they are much wider than deep. The Gainey phase Butler site (Michigan) is one real exception in that its examples are relatively long and wide and more like Parkhill phase examples (Figure 19). At face value, that may indicate that Butler is later in time and more like the later sites. Such an interpretation is consistent with the extensive use at Butler of northern-derived Bayport chert, something not seen at Gainey (Michigan) and at other apparently earlier dating Gainey phase sites (Simons 1997). From the illustrations of the Butler site points (Simons 1997), we have the impression that they may have longer, more often single, fluting and a higher incidence of fishtails. These are characteristics that are tending toward a more Barnes-like appearance and that may also indicate a slightly later date than for other Gainey phase sites.

The shorter overall length and shallower bits on the earlier site end scrapers, along with other contrasts, was argued by Lancashire (2001) to indicate that those earlier assemblages were more heavily resharpened and exhausted, and we concur. Indeed, as discussed above, the shorter the Culloden examples are, the flatter/shallower are the bits. Resharpening is probably not the only factor involved. For example, differences in the blanks selected for end scraper use may also have played a role. This factor may explain why the Butler and later Parkhill/Barnes end scrapers are longer at discard: the knappers were using longer blanks to begin with. Butler end scrapers are longer despite the fact that the bits are quite flat and steep, which strongly suggests that blank length, and not just resharpening, partly accounts for the variability. Similarly, width is not something we would expect to be much affected by resharpening, but the earlier assemblages are narrower. The Culloden examples actually more closely resemble those in the Clovis-like samples or fall between the Clovis-like and Gainey-assigned trianguloid end scraper samples in our database in terms of width and bit thickness (Figure 19). Perhaps this indicates that it is an early dating Gainey phase site or that it dates somewhere between the samples as assigned on the grounds of point typology. For what it is worth, available data for the end scrapers at Nobles Pond, in Ohio, the points from which seem to be intermediate between more Clovis-like and Gainey forms (Seeman et al. 2018), also seem to be relatively narrow and closest, on average, in mean dimension to those at Culloden (mean = 24.6 mm; Shott and Seeman 2017:Table 1).

Regardless, it may be that there is frequent selection of more parallel-sided than expanding flakes, albeit shorter ones, as end scraper blanks on the earlier sites as a whole. Reduction in length would have comparatively little effect on width on the more parallel-sided examples, even if these had been resharpened to quite short lengths. Certainly, the samples from Parkhill/Barnes sites such as Thedford II and Parkhill itself do expand more from the proximal end than do the Culloden examples (Figure 8), probably due to less resharpening, as well as use of more expanding flake blanks. As noted, the Thedford II sample, unlike those from Culloden, is actually dominated by blanks derived from biface cores, and those tend to be more expanding. Yet, flakes from large bifaces do not predominate at the Parkhill site itself (Ellis and Deller 2000:97), and consistent with that preference, the blanks do appear to be somewhat narrower on average in comparison with the other Parkhill phase samples (Figure 19b).

To sum up, consideration of the raw material preferences, channel flake morphology, and the end scraper samples clearly indicate that the Culloden site represent an assemblage associated

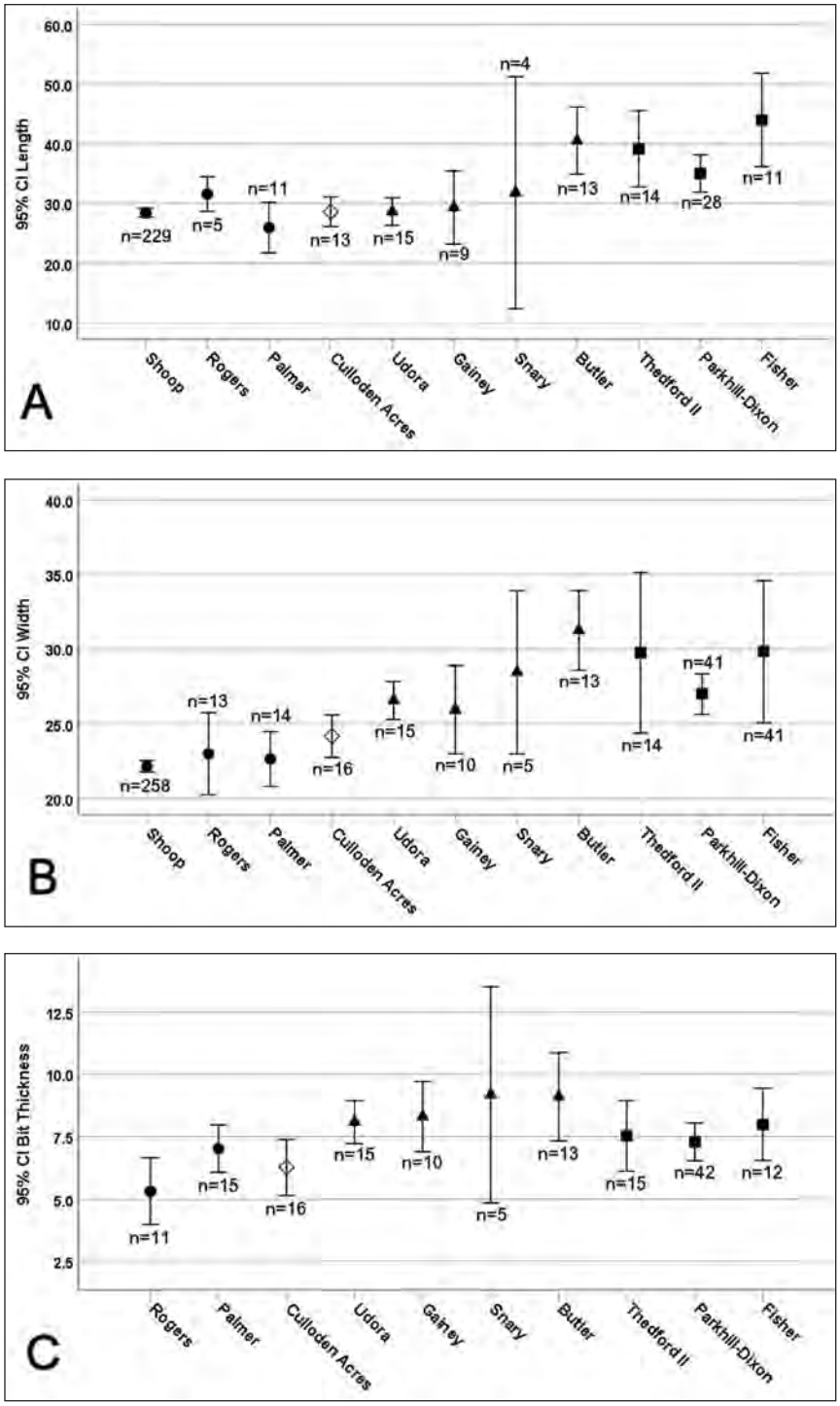
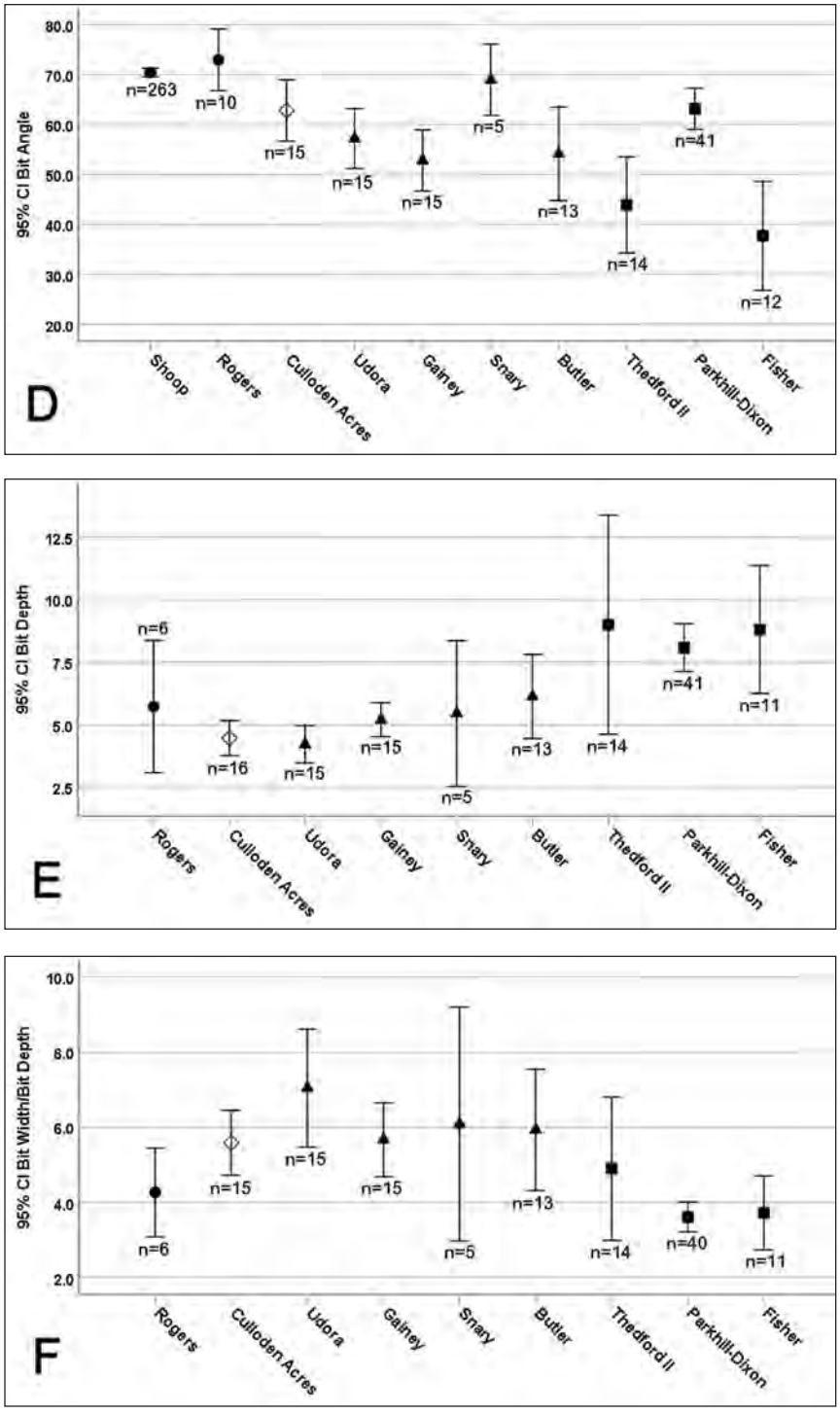


Figure 19. *Mean (mm) and 95% confidence interval plots, trianguloid end scraper samples from Culloden Acres: (a) length; (b) width; (c) bit thickness; (d) bit angle; (e) bit depth; (f) bit width–depth ratio. Open diamond: Culloden Acres; circles: Clovis-like sites;*



triangles: Gainey sites; squares: Parkhill phase sites with Barnes points. Comparative data from Cox (1986), LaDuke and Wright (2018), and Lancashire (2001).

with the earlier, more parallel-sided fluted point–related assemblages. While the data are less clear on a specific phase affiliation, the most likely assignment is to the Gainey phase, but perhaps early within the time span of that phase. As a whole, that development is guess-dated by us to ca. 10,400–10,500 RCYP (12,500–12,200 cal B.P.) based on comparable radiocarbon-dated sites across the Northeast (Lothrop et al. 2016:209–212).

Spatial Organization

The contrasts between Areas A and B at Culloden demonstrate clear spatial patterning in the organization of site activities that, we expect, is an advantage of studying many smaller sites. The trianguloid end scraper focus of Area A, vs. the fluted biface–related activity at B, is of major note here. As discussed earlier, an obvious potential drawback of studying such assemblages is the small sample size, which can skew artifact frequencies. Compared to longer occupations, on briefly used sites more tools proportionally may have been employed but not discarded, as the tool's application lives exceeded the site occupation spans. At Area B, this is not really a problem, as our interpretations of activities are almost solely based on exceptionally tiny flaking debris that is simply discarded at, or at the very least, close to (e.g., in the same site area) where it was produced. Of course, there may have been tools used at Area B that were not discarded. It is possible that that some could have been used, but if they were, we think, based on the debris, that they were mostly bifaces.

The same could be said for Area A. As outlined above, the debris is dominated by uniface retouch flakes, which undoubtedly largely result from trianguloid end scraper resharpening. For hide-working tools, a frequent resharpening was necessary to maintain functional working edges (Weedman 2002, 2006). There were only six biface reduction flakes and perhaps even fewer if the Onondaga items are associated with the Early Archaic and not the Paleo occupation. The very heavy dominance of uniface reduction flakes in contrast to biface reduction suggests that the emphasis on curated biface tools was almost nil. The flaking debris indicates that there was an extreme emphasis on trianguloid end scraper use, which is clearly in line with the tool assemblage. The emphasis on uniface debris at uniface-dominated sites is consistently seen at a wide range of locations—the higher the percentage of uniface debris, the higher the percentage of unifaces (Muller 1999:159–173).

The relative use-lives of the various tool classes at Culloden A also suggest that sample size alone cannot account for the nature of the assemblage. As previously noted, Culloden A is heavily dominated by trianguloid end scrapers. Given their heavy resharpening, these tools were obviously ones with relatively long application lives. As well, the fact they were hafted tools indicates a long-lived form, since the labour investment in manufacture needed to be offset by a relatively long task-application life. Indeed, based on the ethnographic literature, hafted end scrapers used in hide working probably have among the longest application lives of any fine-grained flaked stone tool and are one of the few tool forms whose application life/actual use period can be measured in hours (e.g., Clark and Kurashina 1981). Given this conclusion, the fact that this kind of tool is well represented at Area A strongly suggests that there was a real emphasis on trianguloid end scraper use at this site area. Moreover, at the opposite extreme from the trianguloid end scrapers, the rest of the Area A assemblage includes mainly marginally retouched or unretouched, unhafted, and not resharpened flake tools and/or delicate tools, such as denticulates/retouched flakes and gravers. Based on ethnographic analogues, these tools probably had application lives that could be measured in a few minutes (cf. Hayden 1976: Figure 1). In turn, this information suggests that activities involving these tools were even less important than their absolute numbers would indicate and, conversely, that the use of trianguloid end scrapers was even more important than their frequency alone would indicate.

Also suggestive of actual activity variation or real variation in "substantive behaviour" is that the differences seen at Culloden between uniface, notably trianguloid end scraper, use and fluted

biface–related activities is consistently seen at a wide range of sites (Ellis and Poulton 2014:96–98). This result is not simply the random variation that one would expect if sampling error due to a short occupation span were the primary cause of inter-assemblage variability. The marked difference in fluted biface–related vs. trianguloid end scraper–related frequencies between areas was something that was first noted by us in our work at certain site areas at Parkhill and its associated Dixon site (see Deller and Ellis 1992b). Culloden reinforces that distinction. Indeed, comparison of several Ontario sites and site areas shows that locations can have high percentages of trianguloid end scrapers and few or no fluted bifaces, and vice versa. Alternatively, one can have sites with a low percentage of both these items and, by extension, a dominance of a significant range of other, often much rarer, tool forms (Figure 20). These contrasts are not restricted to the Great Lakes area; they can be seen at a whole host of other sites in the Northeast (e.g., Boisvert et al. 2017:317–318; Singer 2017:Table 5.1; Singer and Jones 2018:112). One can even see such separation spatially within particular areas, albeit sometimes of a broader range of unifaces as a whole vs. fluted bifaces. Examples include Area C at the Parkhill site (Ellis and Deller 2000:190–193) and the Whipple site, New Hampshire (Curran 1984). As well, the spatial contrast is seen in northeastern Late Paleo assemblages (Singer 2017:270) and western Folsom ones (Jodry 1999:235; Morgan and Andrews 2016; Ruth 2013). At the Folsom sites, the end scraper–focussed areas are actually north of the weapon-focussed areas (Ruth 2013:300), exactly as seen at Culloden, a pattern attributed at the western sites to possibly prevailing wind directions. Overall, these pervasive spatial patterns are clearly monitoring activity variation. We do not know that Areas A and B at Culloden were used at the same time. But since the same activity contrasts seen between Area A and B are repeated within the same site areas or in different site area contrasts at several sites with multiple loci, this suggests that the two activities are related and do reflect use in the same occupation or closely related ones.

The differences seen between fluted biface– and end scraper–dominated sites or site areas does not mean that the locations assigned to each category witnessed identical activities or served the same purposes. For example, Culloden B is not plotted in Figure 20, as there are no fluted bifaces per se, but this site area does serve to stress that not all sites with fluted biface–related activities are exactly alike. Some are actually dominated by finished points, such as Parkhill Area B, whereas others, such as the Barnes site, are dominated by bifaces broken in manufacture and are more focussed on gearing-up activities or an anticipated future need for these points. Culloden B is also an area of more gearing-up activities, as the emphasis is on manufacture rather than discard of exhausted tools. The absence of actual bifaces broken in manufacture at Culloden B vs. the Barnes site can be easily attributed to the smaller scale of the activity and/or shorter duration of occupation at Culloden; Barnes had 130 channel flakes (Voss 1977), and, not surprisingly, some preforms broke during the making of this considerable number of points with long fluting. In contrast, fluted biface manufacture at Culloden B was at a much smaller scale, and with the somewhat shorter fluting, it may have had a higher success rate.

In conclusion, the consistency of the recovered Culloden flaking debris types with the recovered tool forms, the dominance of long-lived tool forms, and the strong suggestions that the small sites or site areas fall into discrete categories/types convince us that Areas A and B were quite specialized occupations where trianguloid end scraper use and fluted biface–related activities, respectively, were by far the paramount lithic-related activities.

As discussed earlier, all of the multiple lines of evidence available consistently indicate that trianguloid end scrapers were used in hide preparation. The relatively large spatial extent of the area, and the number of tools recovered,[4] suggest that Area A was a quite intensive area of such preparation, presumably of caribou, given the

[4] Based on their experiments, Seeman et al. (2013:428) suggest that a single end scraper can be used to process a "modest-sized" hide.

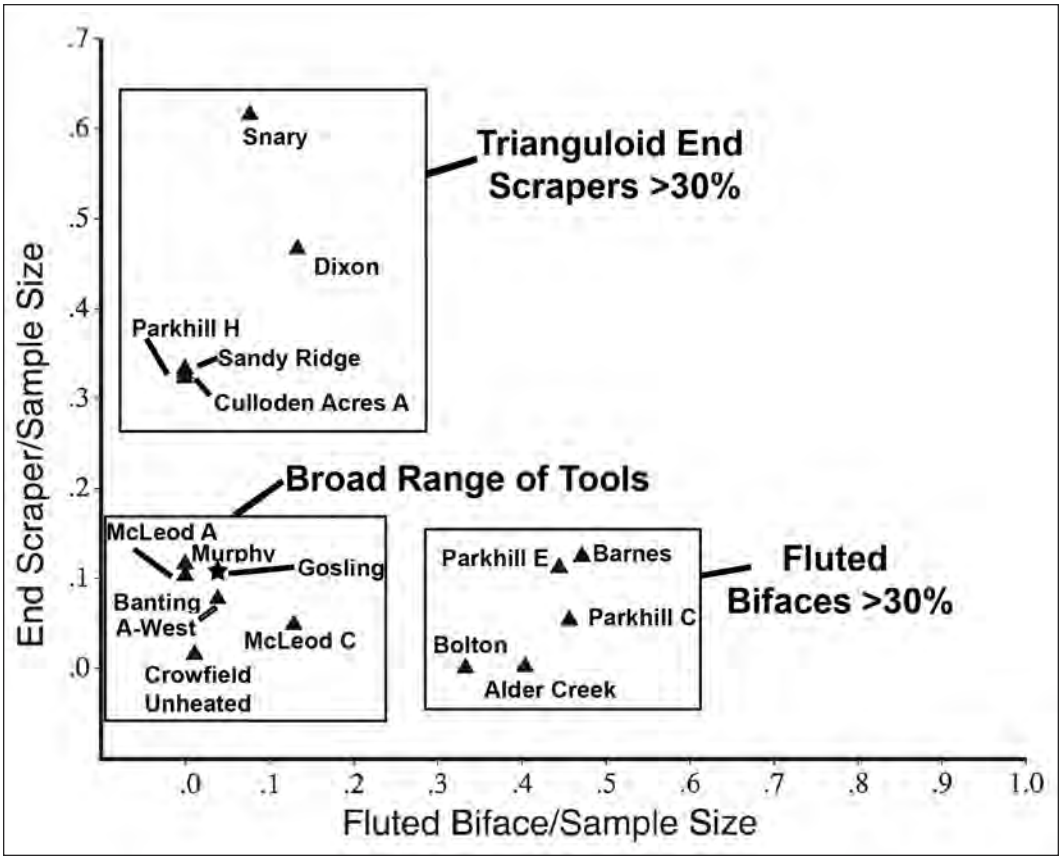


Figure 20. *Graph plotting relationship between trianguloid end scraper and fluted biface proportional frequency at small fluted point sites or site areas. All sites or site areas have sample sizes of tools and preforms totalling 10–65 items. From Ellis and Poulton (2014).*

nature of the environments of the time, aspects of site layouts/locations, and the few sites with some faunal preservation (Carr 2012; Ellis 2011; Ellis and Deller 2000:251–252; Seeman et al. 2013; Spiess et al. 1985; Storck and Spiess 1994). It would not be a surprise to see separate spatial areas devoted to the intensive practice of this activity. As others have noted, intensive hide preparation can require a relatively large work area, is a very messy and odorous activity, and can attract vermin and predators. These characteristics favour it being separated spatially from many other domestic activities (Carr 1984:127; Morgan and Andrews 2016:184; Ruth 2013:126, 258–260). The intensive focus on hide preparation may suggest that several animals were taken and/or butchered nearby, but such locales would be difficult to find in the absence of faunal preservation on these exceptionally ancient sites. In this regard though, it is notable that for the large, bevelled bifaces found on several sites (Ellis and Deller 1988:113–114) there is contextual evidence that they were actually employed in butchering and related tasks (Deller and Ellis 1992b:31). More recently, Boisvert (2018:375–378) has noted the presence of such tools across the entire Northeast and argued that the evidence supports their use in butchering, skinning, and related activities. The fragment of such a tool recovered 60 m south of Area B may indicate such activities in that area and deserves more investigation.

The spatial patterning evident at Culloden has some other potential implications. Smaller sites are more often occupied by task groups. The

more specialized nature of the Culloden areas does suggest use by special task groups as opposed to the more general purpose camps with a wide variety of items, such as Crowfield, Gosling, Murphy, and others shown in Figure 20. Acquiescing to the "tyranny of the ethnographic record," we would argue that the sexual division of labour should be a major determinant of spatial variability in site activities. Task groups are often organized along gender lines, with hide working notably associated with females and weaponry with males, particularly among societies where hunting of larger game is a major focus (Ruth 2013; Waguespack 2005). A hunting focus would be favoured in the Great Lakes area given the nature of the environments and a relative paucity of plant foods (Ellis and Deller 1990:38). We are not the first to suggest this conclusion. It is at least plausible and consistent with other evidence (see Deller and Ellis 2011:148–149) to suggest that the differences between Areas A and B may also be measuring those kinds of gender-related activity organizations.

As a final comment on small sites and spatial associations, we suggested earlier that smaller sites may have certain tool forms in association or contain "basic activity sets" or "tool kits" of items used together in the same or related tasks. There are some potential examples of such associations at Culloden. For example, the jasper concave scraper with evidence of fluted point manufacturing activities at Area B could indicate an association of that tool form with point shaft manufacture. For a further example, the end scraper–dominated area has a smaller number of other tools, notably *pièces esquillées* and gravers. Such an association is also seen at other sites, such as Ohomowauke, in Connecticut. At that site, it was noted that there is evidence that those other tools may have been used for "fabricating bone and antler tools employed in clothing manufacture" (Singer 2017:204), so an association in an activity set with hide scraping tools may also be indicated. It is even possible that this potential association indicates not only use in hide working–related activities, but, more broadly, use in work areas used by women. Archaeologists obviously need data from a larger number of sites to see if these potential patterns hold up to continued scrutiny.

Summary and Conclusions

The investigations at the Culloden Acres site resulted in the recovery of a small Early Paleo tool and waste flake assemblage. We investigated the site to expand our knowledge of the range of variability in these early sites and to evaluate the advantages of studying small sites suggested by previous investigators. In several ways, these advantages were demonstrated, notably that such sites are more likely to have intact spatial organization and represent specialized work areas/task group activity areas.

The nature of the recovered assemblage, specifically details of the channel flake and trianguloid end scraper assemblage and the lithic raw material sources employed, suggests that the site is associated with the Early Paleo Gainey phase, dated to ca. 12,500–12,200 RCYBP. Most of the Paleo material was recovered from two spatially discrete activity areas, dubbed Areas A and B. We do not know if these areas were used at the same time, but that does seem plausible. At both areas, Fossil Hill (Collingwood variant) cherts, from some 180 km to the northeast of the site make up the bulk of the assemblages, but some Onondaga, Pennsylvania jasper, and perhaps Ohio Upper Mercer usage also occurred. Area A was dominated by end scraper–related tasks, notably related to hide working, while Area B involved mostly weapon manufacture. Such a spatial organization is proving to be a consistent pattern on these Paleo sites in many areas, not just Ontario. It is plausible that this spatial separation of activities relates to demands for spatially separating each kind of area from everyday domestic living areas/activities. A potentially messy and odorous task, such as intensive hide processing, would need to be focussed in a separate spatial area. Similarly more intensive fluted biface production and the increased proportion of lithic debris it produces perhaps also warranted separating it from other domestic activities. However, such spatial organization may also be mirroring the role of other organizational factors, such as a gendered division of workspace.

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References Cited

Archaeological Services Inc.
2007 The Stage 4 Salvage Excavation of the Mt. Albion West Site (AhGw-131): Cultural Heritage Resource Assessment, Red Hill Creek Expressway (North–South Section) Impact Assessment, City of Hamilton, Ontario. Unpublished Archaeological Report for Licences 2000–016, 2001-053, P046, P117, MCL CIFs 2000–016–129, 2001-053–015, P046–004, P117–012 Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto.

Boisvert, R. A.
2018 Paleoindian Bifacial Hide-Processing Knives of the Far Northeast: Implications of a Beveled Bipointed Biface from the Jefferson VI Site, Jefferson, New Hampshire. In *In the Eastern Fluted Point Tradition II*, edited by J. A. M. Gingerich, pp. 367–378. University of Utah Press, Salt Lake City.

Boisvert, R. A., T. Krajcika, and M. Greenly
2018 Paleoindian Adaptation to the Landscape of Northern New Hampshire. *PaleoAmerica* 3:313–322.

Bradley, B. A., M. B. Collins, and A. Hemmings
2010 *Clovis Technology*. Archaeological Series No. 17. International Monographs in Prehistory, Ann Arbor.

Brink, J.
1978 *An Experimental Study of Microwear Formation on End Scrapers*. Mercury Series Paper No. 83. Archaeological Survey of Canada, National Museum of Man, Ottawa.

Brose, D.
1984 Archaeological Investigations at the Paleo Crossing Site, a Paleoindian Occupation in Medina County, Ohio. In *The First Discovery of America: Archaeological Evidence of the Early Inhabitants of the Ohio Area*, edited by William Dancy, pp. 61–76. Ohio Archaeological Council, Columbus.

Brown, J. A., and R. Vierra
1983 What Happened in the Middle Archaic? Introduction to an Ecological Approach to Koster Site Archaeology. In *Archaic Hunters and Gatherers in the American Midwest,* edited by J. L. Phillips and J. A. Brown, pp. 165–195. Academic Press, New York.

Calkin, P. E., and B. H. Feenstra
1985 Evolution of the Erie Basin Great Lakes. In *Quaternary Evolution of the Great Lakes,* edited by P. F. Karrow and P. E. Calkin, pp. 149–170. Special Paper No. 30. Geological Association of Canada, St. John's.

Callahan, E.
1979 The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flint Knappers and Lithic Analysts. *Archaeology of Eastern North America* 7(1):1–180.

Carr, C.
1984 The Nature of Organization of Intrasite Archaeological Records and Spatial Analytical Approaches to Their Investigation. *Advances in Archaeological Method and Theory* 7:103–222.

Carr, D. H.
2012 *Paleoindian Economic Organization in the Lower Great Lakes Region: Evaluating the Role of Caribou as a Critical Resource.* Unpublished Ph.D. dissertation, Department of Anthropology, Michigan State University, East Lansing.

Carr, K. W., J. M. Adovasio, and J. Vento
2013 A Report on the 2008 Field Investigations at the Shoop Site (36DA20). In *In the Eastern Fluted Point Tradition,* edited by Joseph A. M. Gingerich, pp. 75–103. University of Utah Press, Salt Lake City.

Clark, J. D., and H. Kurashina
1981 A Study of the Work of a Modern Tanner in Ethiopia and Its Relevance for Archaeological Interpretation. In *Modern Material Culture: The Archaeology of Us*, edited by R. Gould and M. B. Schiffer, pp. 303–321. Academic Press, New York.

Clermont, N., C. Chapdelaine, and J. Cinq-Mars
(editors) *Île aux Allumettes, l'Archaïque Supérieur dans*
2003 *l'Outouais.* Paléo-Québec No. 30. Recherches amérindiennes au Québec, Montréal.

Collins, M. B.
1975 Lithic Technology as a Means of Processual Inference. In *Lithic Technology: Making and Using Stone Tools*, edited by E. Swanson, pp. 15–34. The Hague, Mouton.

Cox, S. L.
1986 A Re-Analysis of the Shoop Site. *Archaeology of Eastern North America* 14:101–170.

Curran, M. L.
1984 The Whipple Site and Paleo-Indian Tool Assemblage Variation: A Comparison of Intrasite Structuring. *Archaeology of Eastern North America* 12:5–40.

Deller, D. B.
1976 Paleo-Indian Locations on Late Pleistocene Shorelines, Middlesex County, Ontario. *Ontario Archaeology* 26:3–19.
1979 Paleo-Indian Reconnaissance in the Counties of Lambton and Middlesex, Ontario. *Ontario Archaeology* 32:3–20.
1988 *The Paleo-Indian Occupation of Southwestern Ontario: Distribution, Technology and Social Organization.* Unpublished Ph.D. dissertation, Department of Anthropology, McGill University, Montréal.

Deller, D. Brian, and Christopher J. Ellis
1984 Crowfield: A Preliminary Report on a Probable Paleo-Indian Cremation in Southwestern Ontario. *Archaeology of Eastern North America* 12: 41–71.
1988 Early Palaeo-Indian Complexes in Southwestern Ontario. In *Late Pleistocene and Early Holocene Paleoecology and Archaeology of the Eastern Great Lakes Region*, edited by Richard Laub, Norton Miller, and David Steadman, pp. 251–263. Bulletin No. 33. Buffalo Society of Natural Sciences, Buffalo, New York.
1992a *Thedford II: A Paleo-Indian Site in the Ausable River Watershed of Southwestern Ontario*. Memoir No. 24. Museum of Anthropology, University of Michigan, Ann Arbor.
1992b The Early Paleo-Indian Parkhill Phase in Southwestern Ontario. *Man in the Northeast* 44:15–54.

1996 The Bolton Site (AfHj-89): A Crowfield Phase Early Paleo-Indian Site in Southwestern Ontario. *Ontario Archaeology* 61:5–44.

2001 Evidence for Late Paleo-Indian Ritual from the Caradoc Site (AfHj-104), Southwestern Ontario, Canada. *American Antiquity* 66:267–284.

2010 Some Sites and Artifacts I Have Known: The Weed (AfHl-1) Early Paleo-Indian Site. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 10(1–2):1–13.

2011 *The Crowfield Site (AfHj-31): A Unique Paleoindian Fluted Point Site in Southwestern Ontario*. Memoir No. 49. Museum of Anthropology, University of Michigan, Ann Arbor.

Deller, D. B, C. J. Ellis, and M. Franklin

2018 The Rogers Site: An Early Paleoindian Site in the Niagara Peninsula Region of Ontario. *Archaeology of Eastern North America* 46:103–134.

Deller, D. B., C. J. Ellis, and J. R. Keron

2009 Understanding Cache Variability: A Deliberately Burned Early Paleoindian Tool Assemblage from the Crowfield Site, Southwestern Ontario, Canada. *American Antiquity* 74:371–397.

Ellis, C. J.

1979 *Analysis of Lithic Debitage from Fluted Point Sites in Ontario.* M. A. thesis, Department of Anthropology, McMaster University, Hamilton, Ontario.

1984 *Paleo-Indian Lithic Technological Structure and Organization in the Lower Great Lakes Area: A First Approximation*. Ph.D. dissertation, Department of Archaeology, Simon Fraser University, Burnaby, B.C.

1993 Premières Industries lithiques Paléo-Indiennes de la région N-E de l'Amérique du nord dans leurs principaux contextes (temps, espace, paléo-environnement, sites, culture). *L'Anthropologie* 97(4):586–622.

1994 Some Unanswered Questions Concerning Early Paleo-Indian Settlement and Subsistence in Southern Ontario. In *Great Lakes Archaeology and Paleoecology: Exploring Interdisciplinary Initiatives for the Nineties*, edited by R. MacDonald, pp. 413–429. Publication No. 10. Quaternary Sciences Institute, University of Waterloo, Ontario.

1997 Factors Influencing the Use of Stone Projectile Tips: An Ethnographic Perspective. In *Projectile Technology*, edited by Heidi Knecht, pp. 37–74. Plenum Press, New York.

2002 Les Assemblages Archéologiques du Paléoindien du Sud de l'Ontario. *Recherches Amérindiennes au Québec* 32(3):7–26.

2011 Measuring Paleoindian Range Mobility and Land-Use in the Great Lakes/Northeast. *Journal of Anthropological Archaeology* 30:385–401.

2014 Paleoindians. In *Encyclopedia of Global Archaeology*, edited by Claire Smith, pp. 5760–5767. Berlin & Heidelberg, Springer-Verlag.

2015 Some Sites and Artifacts I Have Known: The Walsh Point, a Quartz Fluted Point from Near Napanee, Ontario. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 15(4–5):1–6.

2017 Ontario Paleo Research, 25+ Years Later. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 17(1–4):2–28.

2019 On the Reality of Gainey Points. *PaleoAmerica* 5:211–217.

Ellis, C. J., D. H. Carr, and T. J. Loebel

2011 The Younger Dryas and Late Pleistocene Peoples of the Great Lakes Region. *Quaternary International* 242(2):534–545.

Ellis, C. J., and D. B. Deller

1980 Test Excavations on Two Small Fluted Point Sites in Ontario. In *An Archaeological Survey in the Counties of Lambton and Middlesex Including Test Excavations at Two Paleo-Indian Sites*, by D. B. Deller, pp. 92–156. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto. Copies available from OMTCS, Toronto.

1988 Some Distinctive Paleo-Indian Tool Types from the Lower Great Lakes Area. *Midcontinental Journal of Archaeology* 13:111–158.

1990 Paleo-Indians. In *The Archaeology of Southern Ontario to A.D.1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 37–63. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

1991a A Small (but Informative) Early Archaic Assemblage from the Culloden Acres Site, Area B. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 91(8):2–17.

1991b Investigations at Small Early Paleo-Indian Sites in Southwestern Ontario, 1990: Culloden Acres, Bolton and Murphy. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto, and Social Sciences and Humanities Research Council of Canada, Ottawa. Copies available from OMTCS, Toronto.

2000 *An Early Paleo-Indian Site near Parkhill, Ontario*. Mercury Series Paper No. 159. Archaeological Survey of Canada, Canadian Museum of Civilization, Ottawa.

Ellis, C. J., D. B. Deller, and L. J. Jackson

1992 Investigations at Small, Interior Early Paleo-Indian Sites in Southwestern Ontario. *Annual Archaeological Report for Ontario for 1991*, New Series 2:92–96.

Ellis, C. J., I. T. Kenyon, and M. W. Spence

1990 The Archaic. In *The Archaeology of Southern Ontario to A.D.1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 65–124. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

Ellis, C. J., and J. C. Lothrop

2019 Early Fluted-biface Variation in Glaciated Northeastern North America. *PaleoAmerica* 5:121–131.

Ellis, C. J., and J. Payne

1995 Estimating Failure Rates in Fluting Based on Archaeological Data: Examples from NE North America. *Journal of Field Archaeology* 22:459–474.

Ellis, C. J., and D. R. Poulton

2014 The Gosling Site (AiHb-189), a Small Parkhill Phase Paleoindian Site in Guelph, Ontario. *Ontario Archaeology* 94:81–111.

Ellis, C. J., P. A. Timmins, and H. Martelle

2009 At the Crossroads and Periphery: The Archaic Archaeological Record of Southern Ontario. In *Archaic Societies: Diversity and Complexity Across the Midcontinent,* edited by T. E. Emerson, A. Fortier, and D. McElrath, pp. 787–840. State University of New York Press, Albany.

Ellis, C. J., J. H. Tomenchuk, and J. D. Holland

2003 Typology, Use and Sourcing of the Late Pleistocene Lithic Artifacts from the Hiscock Site. In *The Hiscock Site: Late Pleistocene and Holocene Paleoecology and Archaeology of Western New York State*, edited by R. Laub, pp. 221–237. Bulletin No. 37. Buffalo Society of Natural Sciences, Buffalo, New York.

Finlayson, W. A.

1977 *The Saugeen Culture: A Middle Woodland Manifestation in Southwestern Ontario.* Mercury Series Paper No. 61. Archaeological Survey of Canada, National Museum of Man, Ottawa.

Fox, W. A.

2009 Ontario Cherts Revisited. In *Painting the Past with a Broad Brush: Papers in Honour of James Valliere Wright*, edited by D. L. Keenlyside and J. -L. Pilon, pp. 353–369. Mercury Series Paper No. 170. Canadian Museum of Civilization, Gatineau, Québec.

Frison, G. C.

1968 A Functional Analysis of Certain Chipped Stone Tools. *American Antiquity* 33:149–155.

Frison, G. C., and B. Bradley

1980 *Folsom Tools and Technology at the Hanson Site, Wyoming*. University of New Mexico Press, Albuquerque.

Funk, R. F.

1988 The Laurentian Concept: A Review. *Archaeology of Eastern North America* 16:1–42.

Gallagher, J.
1977 Contemporary Stone Tools in Ethiopia: Implications for Archaeology. *Journal of Field Archaeology* 4:407–414.

Gardner, W. A.
1983 Stop Me If You've Heard This One Before: The Flint Run Paleoindian Complex Revisited. *Archaeology of Eastern North America* 11:49–64.

Gillespie, J. D.
2003 Rethinking Taxonomy on the Northern Plains: A Comment on Yellowhorn's "Regarding the American Paleolithic." *Canadian Journal of Archaeology* 27:309–313.

Gingerich, J. A. M.
2013 Revisiting Shawnee-Minisink. In *In the Eastern Fluted Point Tradition,* edited by J. A. M. Gingerich, pp. 218–256. University of Utah Press, Salt Lake City.

Gramly, R. M.
1982 *The Vail Site: A Palaeo-Indian Encampment in Maine.* Bulletin No. 33. Buffalo Society of Natural Sciences, Buffalo, New York.

Gramly, R. M., and R. E. Funk
1990 What Is Known and Not Known About the Human Occupation of the Northeastern United States Until 10,000 B.P. *Archaeology of Eastern North America* 18:5–31.

Gramly, R. M., and G. Summers
1986 Nobles Pond: A Fluted Point Site in Northeastern Ohio. *Midcontinental Journal of Archaeology* 11:97–123.

Grimes, J.
1979 A New Look at Bull Brook. *Anthropology* 3:109–130.

Hanson, C.
2010 *The Early Paleoindian Occupation of Southern Ontario: Temporal and Spatial Trends.* Unpublished M.A. thesis, Department of Anthropology, University of Western Ontario, London, Ontario.

Hanson, C., and C. J. Ellis
2012 An Updated Fluted Point Survey for Southern Ontario. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 12(1–2):8–11.

Hayden, B.
1976 Curation: Old and New. In *Primitive Art and Technology,* edited by J. S. Raymond, B. Loveseth, C. Arnold, and G. Reardon, pp. 27–46. University of Calgary Archaeological Association, Calgary.
1979 Snap, Shatter and Superfractures: Use-Wear of Stone Skin Scrapers. In *Lithic Use-Wear Analysis,* edited by B. Hayden, pp. 207–230. Academic Press, New York.
1980 Confusion in the Bipolar World: Bashed Pebbles and Splintered Pieces. *Lithic Technology* 9(1):2–7.
1990 The Right Rub: Hide Working in High Ranking Households. In *The Interpretative Possibilities of Microwear Studies*, edited by B. Graslund, pp. 89–102. Societas Archaeologica Upsaliensis, Uppsala.

Hofman, J. L., D. S. Amick, and R. O. Rose
1990 Shifting Sands: A Folsom-Midland Assemblage from a Campsite in Western Texas. *Plains Anthropologist* 35:221–253.

Iceland, H.
2013 Refining Paleo-Indian Lithic Technology at Shawnee-Minisink via an Artifact Refitting Study. *North American Archaeologist* 34:237–267.

Jackson, L. J.
1990 Interior Paleoindian Settlement Strategies: A First Approximation for the Lower Great Lakes. In *Early Paleoindian Economics of Eastern North America*, edited by K. Tankersley and B. Isaac, pp. 95–142. Research in Economic Anthropology, Supplement 5. JAI Press, Greenwich, Connecticut.
1994 *Gainey Phase Occupation in the Southern Rice Lake Region, Canada*. Unpublished Ph.D. dissertation, Department of Anthropology, Southern Methodist University, Dallas, Texas. University Microfilms, Ann Arbor.
1996 Murphy: An Early Palaeo-Indian Gainey Phase Site in Southwestern Ontario. *Ontario Archaeology* 62:10–38.
1998 *The Sandy Ridge and Halstead Paleo-Indian Sites: Unifacial Tool Use and Gainey Phase Definition in South-Central Ontario.* Memoir No. 32. Museum of Anthropology, University of Michigan, Ann Arbor.

Jackson, L. J., C. J. Ellis, A. V. Morgan, and J. H. McAndrews
2000 Glacial Lake Levels and Eastern Great Lakes Palaeo-Indians. *Geoarchaeology* 15:415–440.

Jackson, L. J., and H. McKillop
1987 Early Paleoindian Occupation in Interior Southcentral Ontario. *Current Research in the Pleistocene* 4:11–14.
1991 Approaches to Paleo-Indian Economy: An Ontario and Great Lakes Perspective. *Midcontinental Journal of Archaeology* 16:34–68.

Jodry, M.
1999 *Folsom Technological and Socioeconomic Strategies: Views from Stewart's Cattle Guard and the Upper Rio Grande Basin, Colorado*. Unpublished Ph.D. dissertation, Department of Anthropology, American University, Washington, D.C.

Karrow, P. F.
1995 The Quaternary Geology of the Area around the Bolton and Culloden Archaeological Sites, Middlesex County, Ontario. Report on file, Museum of Ontario Archaeology, London, Ontario.
2012 The Geology of the Area around the Bolton and Culloden Archaeological Sites, Middlesex County, Ontario. Report on file, Museum of Ontario Archaeology, London, Ontario.

Kelly, R. L.
1995 *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways*. Smithsonian Institution Press, Washington, D.C.

Kenyon, I. T.
1989 Terminal Archaic Projectile Points in Southwestern Ontario: An Exploratory Study. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 89(1):2–21.

LaDuke, T., and H. T. Wright
2018 A Late Glacial and Holocene Site in the Western Erie Basin: A Report on the 2010–2014 Excavations at the Palmer I Site, Monroe Co. Michigan. *Archaeology of Eastern North America* 46:135–154.

Lancashire, S.
2001 *Early Paleoindian Trianguloid End Scrapers: An Analysis*. Unpublished M.A. thesis, Department of Anthropology, University of Western Ontario, London, Ontario.

Lawrence, R.
1979 Experimental Evidence for the Significance of Attributes Used in Edge-Damage Analysis. In *Lithic Use-Wear Analysis*, edited by B. Hayden, pp. 113–121. Academic Press, New York.

LeBlanc, R. A.
1992 Wedges, Pièce Esquillées, Bipolar Cores and Other Things: An Alternative to Shott's View of Bipolar Industries. *North American Archaeologist* 13:1–14.

Loebel, T. J.
2013 Endscrapers, Use-Wear and Early Paleoindians in Eastern North America. In *In the Eastern Fluted Point Tradition*, edited by J. A. M. Gingerich, pp. 315–330. University of Utah Press, Salt Lake.

Lothrop, J. C.
1988 *The Organization of Paleoindian Lithic Technology at the Potts Site*. Unpublished Ph.D. dissertation, Department of Anthropology, State University of New York, Binghamton. University Microfilms, Ann Arbor.
1989 The Organization of Paleoindian Lithic Technology at the Potts Site. In *Eastern Paleoindian Lithic Resource Use,* edited by C. Ellis and J. Lothrop, pp. 99–137. Westview Press, Boulder, Colorado.

Lothrop, J. C., D. Lowery, A. E. Spiess, and C. J. Ellis
2016 Early Human Settlement of Northeastern North America. *PaleoAmerica* 2:192–251.

Lovis, W. A. (editor)
1989 *Archaeological Investigations at the Weber I (20SA581) and Weber II (20SA582) Sites, Frankenmuth Township, Saginaw County, Michigan,* Volume 1. Michigan Cultural Resource Series. Michigan Department of Transportation, Lansing.

MacDonald, G. F.
1968 *Debert: A Palaeo-Indian Site in Central Nova Scotia*. Anthropology Papers No. 16. National Museum of Man, Ottawa.

Maika, M.
2012 *A Use-Wear Analysis of Gravers from Paleo-Indian Archaeological Sites in Southern Ontario*. Unpublished M.A. thesis, Department of Anthropology, University of Western Ontario, London, Ontario.

Mason, O. T.
1890 Aboriginal Skin Dressing—A Study Based on Material in the U. S. National Museum. *Report of the National Museum for 1899,* Section III, pp. 553–589.

Meltzer, D. J.
2009 *First Peoples in a New World: Colonizing Ice Age America*. University of California Press, Berkeley.

Miller, G. L.
2014 Lithic Microwear Analysis as a Means to Infer Production of Perishable Technology: A Case from the Great Lakes. *Journal of Archaeological Science* 49:292–301.

Morgan, B., and B. Andrews
2016 Folsom Stone Tool Distribution at the Mountaineer Block C Dwelling: Indoor and Outdoor Spaces as Activity Areas. *PaleoAmerica* 2:179–187.

Moseley, M. E., and C. J. Mackey
1972 Peruvian Settlement Pattern Studies and Small Site Methodology. *American Antiquity* 37:67–81.

Muller, J.
1999 *The McLeod Site: A Small Paleo-Indian Occupation in Southwestern Ontario.* Unpublished M.A. thesis, Department of Anthropology, McMaster University, Hamilton, Ontario.

Nobes, D. C.
1994 Geophysics and Archaeology: Non-Destructive Survey Techniques. In *Great Lakes Archaeology and Paleoecology: Exploring Interdisciplinary Initiatives for the Nineties,* edited by R. I. MacDonald, pp. 367–411. Publication No. 10. Quaternary Sciences Institute, University of Waterloo, Ontario.0

Parkins, W.
1977 *Onondaga Chert: Geological and Palynological Studies as Applied to Archaeology*. Unpublished M.Sc. thesis, Department of Geological Sciences, Brock University, St. Catharines, Ontario.

Payne, J. H.
1987 *Windy City (154–16): A Paleoindian Lithic Workshop in Northern Maine*. Unpublished M.Sc. thesis, Institute for Quaternary Studies, University of Maine, Orono.

Perino, G.
1963 Tentative Classification of Two Projectile Points and One Knife from West-Central Illinois. *Central States Archaeological Journal* 10(3):95–100.

Perrone, A., M. Wilson, M. Fisch, B. Buchanan,
M. R. Bebber, and M. I. Eren
2000 Human Behavior or Taphonomy? On the Breakage of Eastern North American Paleoindian Endscrapers. *Archaeological and Anthropological Sciences* 12: in press.

Ritchie, W. A.
1971 *A Typology and Nomenclature for New York Projectile Points*, Revised Edition. Bulletin No. 384. New York State Museum and Science Service, Albany, New York.

Roosa, W. B.
1965 Some Great Lakes Fluted Point Types. *Michigan Archaeologist* 11(3–4): 89–102.
1968 *Data on Early Sites in Central New Mexico and Michigan.* Ph.D. dissertation, Department of Anthropology, University of Michigan. University Microfilms, Ann Arbor.
1977a Great Lakes Paleo-Indian: The Parkhill Site, Ontario. *Annals of the New York Academy of Sciences* 288:349–354.
1977b Fluted Points from the Parkhill, Ontario Site. In *For the Director: Research Essays in Honor of James B. Griffin*, edited by C. Cleland, pp. 87–122. Anthropological Papers No. 61, Museum of Anthropology, University of Michigan, Ann Arbor.

Roosa, W. B., and D. B. Deller
1982 The Parkhill Complex and Great Lakes Paleo-Indian. *Ontario Archaeology* 37:3–15.

Rule, P., and J. L. Evans
1985 The Relationship of Morphological Variation to Hafting Techniques among Paleoindian Endscrapers at the Shawnee Minisink Site. In *Shawnee Minisink: A Stratified Paleoindian-Archaic Site in the Upper Delaware River Valley of Pennsylvania,* edited by C. W. McNett, pp. 211–220. Academic Press, New York.

Ruth, S.
2013 *Women's Toolkits: Engendering Paleoindian Technological Organization*. Unpublished Ph.D. dissertation, Department of Anthropology, University of New Mexico, Albuquerque.

Sassaman, K. E.
1992 Lithic Technology and the Hunter-Gatherer Sexual Division of Labour. *North American Archaeologist* 13:249–262.

Schiffer, M. B.
1976 *Behavioural Archaeology*. Academic Press, New York.
1987 *Formation Processes of the Archaeological Record.* University of New Mexico Press, Albuquerque.

Seeman, M. F., T. J. Loebel, A. Comstock, and G. L. Summers
2013 Working with Wilmsen: Paleoindian End Scraper Design and Use at Nobles Pond. *American Antiquity* 78:407–432.

Seeman, M. F., G. L. Summers, N. E. Nilsson, and P. J. Barans
2018 A Description of Fluted Points from Nobles Pond (33ST357), a Paleoindian Site in Northeastern Ohio. In *In the Eastern Fluted Point Tradition II,* edited by Joseph Gingerich, pp. 379–405. University of Utah Press, Salt Lake City.

Shiner, J.
1970 Activity Analysis of a Prehistoric Site. *Bulletin of the Texas Archaeological Society* 41:25–36.

Shott, M. B.
1989a Diversity, Organization and Behaviour in the Material Record: Ethnographic and Archaeological Examples. *Current Anthropology* 30:283–315.
1989b On Tool Class Use-Lives and the Formation of Archaeological Assemblages. *American Antiquity* 54:9–30.
1990 Stone Tools and Economics: Great Lakes Paleo-Indian Examples. In *Early Paleoindian Economies of Eastern North America*, edited by K. Tankersley and B. Isaac, pp. 3–43. Research in Economic Anthropology, Supplement 5. JAI Press, Greenwich, Connecticut.
1993 *The Leavitt Site: A Parkhill Phase Paleo-Indian Occupation in Central Michigan.* Memoir No. 25. Museum of Anthropology, University of Michigan, Ann Arbor.
1999 On Bipolar Reduction and Splintered Pieces. *North American Archaeologist* 20:217–238.

Shott, M. B., and M. F Seeman
2017 Use and Multifactorial Reconciliation of Uniface Reduction Measures: A Pilot Study at the Nobles Pond Paleoindian Site. *American Antiquity* 82:1–19.

Simons, D. B.
1997 The Gainey and Butler Sites as Focal Points for Caribou and People. In *Caribou and Reindeer Hunters of the Northern Hemisphere*, edited by L. J. Jackson and P. T. Thacker, pp. 105-131. Glasgow /Scotland, Avebury Press.

Simons, D. B., M. B. Shott, and H. T. Wright
1984 The Gainey Site: Variability in a Great Lakes Paleo-Indian Assemblage. *Archaeology of Eastern North America* 12:266–279.

Singer, Z. L.
2017 *The Paleoindian Occupation of Southern New England: Evaluating Sub-Regional Variation in Paleoindian Lifeways in the New England-Maritimes Region.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Connecticut, Storrs.

Singer, Z. L., and B. Jones
2018 Hidden Creek and Ohomowauke: Documenting Continuity and Variability between Two Paleoindian Sites on the Mashantucket Pequot Reservation in Southeastern Connecticut. In *In the Eastern Fluted Point Tradition II*, edited by J. A. M. Gingerich, pp. 93–115. University of Utah Press, Salt Lake City.

Spence. M. W., R. Pihl, and C. Murphy
1990 Cultural Complexes of the Early and Middle Woodland Periods. In *The Archaeology of Southern Ontario to A.D. 1650,* edited by C. J. Ellis and N. Ferris, pp. 125–169. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

Spiess, A. E., M. L. Curran, and J. R. Grimes
1985 Caribou (Rangifer tarandus L.) Bones from New England Paleoindian Sites. *North American Archaeologist* 6:145–159.

Spiess, A E., and D. L. Wilson
1988 *Michaud: A Paleoindian Site in the New England-Maritimes Region.* Occasional Publications in Maine Archaeology No. 6. The Maine Historic Preservation Commission and The Maine Archaeological Society, Augusta.

Stevenson, M.
1985 The Formation of Artifact Assemblages at Workshop/Habitation Sites: Models from Peace Point in Northern Alberta. *American Antiquity* 50:63–81.
1991 Beyond the Formation of Hearth-Associated Artifact Assemblages. In *The Interpretation of Archaeological Spatial Patterning,* edited by E. Kroll and T. D. Price, pp. 269–305. Plenum Press, New York.

Stewart, A.
1984 The Zander Site: Paleo-Indian Occupation of the Southern Holland Marsh Region of Ontario. *Ontario Archaeology* 42:45–79.
1997 Inter-Assemblage Patterning and Site Formation. In *The Fisher Site: Archaeological, Geological and Paleobotanical Studies at an Early Paleoindian Site in Southern Ontario, Canada,* edited by P. L. Storck, pp. 163–188. Memoir No. 30. Museum of Anthropology, University of Michigan, Ann Arbor.

Stoltman, J. B.
1993 A Reconsideration of Fluted Point Diversity in Wisconsin. In *Archaeology of Eastern North America, Papers in Honor of Stephen Williams,* edited by James B. Stoltman, pp. 61–72. Archaeological Report No. 25. Mississippi Department of Archives and History, Jackson.

Storck, P. L.
1979 *A Report on the Banting and Hussey Sites: Two Palaeo-Indian Campsites in Simcoe County, Southern Ontario.* Mercury Series Paper No. 93. Archaeological Survey of Canada, National Museum of Man, Ottawa.
1983 The Fisher Site, Fluting Techniques and Paleo-Indian Cultural Relationships. *Archaeology of Eastern North America* 11:80–97.
1988 Recent Excavations at the Udora Site: A Gainey/Clovis Occupation Site in Southern Ontario. *Current Research in the Pleistocene* 5:23–24.

Storck, P. L. (editor)
1997 *The Fisher Site: Archaeological, Geological and Paleobotanical Studies at an Early Paleoindian Site in Southern Ontario, Canada*. Memoir No. 30. Museum of Anthropology, University of Michigan, Ann Arbor.

Storck, P. L., and A. E. Spiess
1994 The Significance of New Faunal Identifications Attributed to an Early Paleoindian (Gainey Complex) Occupation at the Udora Site, Ontario. *American Antiquity* 59:121–142.

Storck, P. L., and J. H. Tomenchuk
1990 An Early Paleo-Indian Cache of Informal Tools at the Udora Site, Ontario. In *Early Paleo-Indian Economies of Eastern North America*, edited by K. Tankersley and B. Isaac, pp. 45–93. Research in Economic Anthropology, Supplement 5. JAI Press, Greenwich, Connecticut.

Storck, P. L., and P. von Bitter
1989 The Geological Age and Occurrence of Fossil Hill Formation Chert: Implications for Early Paleoindian Settlement Patterns. In *Eastern Paleoindian Lithic Resource Use*, edited by C. Ellis and J. Lothrop, pp. 165–189. Westview Press, Boulder, Colorado.

Timmins, P.
1994 Alder Creek: A Paleo-Indian Crowfield Phase Manifestation in the Region of Waterloo, Ontario. *Midcontinental Journal of Archaeology* 19:170–197.

Tomenchuk, J. H.
1994 Preliminary Report on the Parametric Use-Wear Analysis of the Culloden Acres Lithic Assemblage. Report on file, Museum of Ontario Archaeology, London, Ontario.

Voss, J.
1977 The Barnes Site: Functional and Stylistic Variability in a Small Paleo-Indian Assemblage. *Midcontinental Journal of Archaeology* 2:283–305.

Waguespack, N.
2005 The Organization of Male and Female Labor in Foraging Societies: Implications for Early Paleoindian Archaeology. *American Anthropologist* 107:666–676.

Warner, B. G., P. F. Karrow, and S. G. Marsters
1991 Appendix A: Paleoenvironmental Studies. In *Investigations at Small Early Paleo-Indian Sites in Southwestern Ontario, 1990: Culloden Acres, Bolton and Murphy*, edited by C. J. Ellis and D. B. Deller, pp. 227–250. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto, and Social Sciences and Humanities Research Council of Canada, Ottawa. Copies available from OMTCS, Toronto.

Weedman, K.
2002 On the Spur of the Moment: Effects of Age and Experience on Hafted Stone Scraper Morphology. *American Antiquity* 67:731–744.
2006 An Ethnoarchaeological Study of Hafting and Stone Tool Diversity Among the Gamo of Ethiopia. *Journal of Archaeological Method and Theory* 13:189–238.

Wilke, Philip J., J. J. Flenniken, and T. L. Ozbun
1991 Clovis Technology at the Anzick Site, Montana. *Journal of California and Great Basin Anthropology* 13:242–272.

Witthoft, J. H.
1952 A Paleo-Indian Site in Eastern Pennsylvania: An Early Hunting Culture. *Proceedings of the American Philosophical Society* 96(4):464–495.

Woodley, P.
2004 Fowler Site: A Holcombe Camp near Lake Simcoe, Ontario. In *The Late Palaeo-Indian Great Lakes: Geological and Archaeological Investigations of Late Pleistocene and Early Holocene Environments*, edited by L. J. Jackson and Andrew Hinshelwood, pp. 163–199. Mercury Series Paper No. 165. Archaeological Survey of Canada, National Museum of Man, Ottawa.

Wortner, S., and C. J. Ellis
1993 The Snary Early Paleo-Indian Site. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 93(2):3–15.

Wright, H. T., and W. B. Roosa
1966 The Barnes Site: A Fluted Point Assemblage from the Great Lakes Region. *American Antiquity* 31:850–860.

Yellowhorn, E.
2003 Regarding the American Paleolithic. *Canadian Journal of Archaeology* 27:62–73.

Le site de Culloden Acres a fait l'objet de fouilles en 1990 dans le cadre d'un projet d'exploration de sites où une petite pointe cannelée fut trouvée. L'un des objectifs consistait à corriger la subjectivité des travaux antérieurs qui avaient été plutôt axés sur des sites plus grands situés près de la ligne de rivage du lac Algonquin, où des bifaces avaient été récupérés. Par ailleurs, un deuxième objectif consistait à explorer les caractéristiques de petits sites que certains archéologues avaient suggérés comme étant des lieux propices à la découverte de la vie de gens d'autrefois. Les sites de plus petite taille sont plus susceptibles d'avoir été occupés à plus court terme. Par ailleurs, il y a de meilleures chances que ces sites conservent une répartition spatiale intacte grâce aux outils qui auraient pu être laissés à l'endroit où ils ont été utilisés, permettant ainsi d'éclairer sur la façon dont les activités, et possiblement le travail, y avaient lieu. Deux principales zones d'activité ont été déterminées. L'une de ces zones a uniquement révélé des débris découlant de procédés de fabrication de pointes cannelées, tandis que sur l'autre site, seuls des grattoirs à bout triangulaire, qui, selon de nombreuses preuves, ont servi à travailler le cuir, y ont été trouvés. Des répartitions spatiales congruentes comparables comme celles retrouvées sur le site de Culloden Acres ont été suggérées à divers emplacements de plusieurs sites paléo dans le Sud de l'Ontario et ailleurs; la raison potentielle entourant cette multitude d'organisation spatiale fait actuellement l'objet d'études. Bien qu'aucune pointe cannelée ne fut trouvée au site Culloden, les matières premières privilégiées qui y ont été repérées, notamment des éclats et des bouts de grattoirs, et les similitudes que le site présente avec d'autres sites d'assemblage, laissent croire que le site Culloden constitue un site paléo datant d'une phase Gainey précoce.

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An Analysis of Ceramic Artifacts from the Cayuga Bridge Site (AfGx-1)

Christopher Watts

Archaeological investigations at the Cayuga Bridge site (AfGx-1), carried out in 2011 by New Directions Archaeology, revealed a substantial collection of more than 35,000 ceramic artifacts that may be assigned to the early Late Woodland Princess Point complex, ca. A.D. 500–1000. Of these artifacts, 322 pottery vessels and an assortment of smoking pipes were identified and analyzed by the author with an eye toward (1) characterizing design profiles at the site; (2) assessing the collection for intrasite variability, and (3) positioning design characteristics at Cayuga Bridge within a continuum of Princess Point pottery development through time. The analysis suggests that potters employed a limited array of tools, techniques, and motifs when decorating their pots, leading to fairly homogenous design profiles on interior, lip, and exterior surfaces. The frequency of decoration, along with available radiocarbon assays, would seem to place Cayuga Bridge in the latter half of the early Late Woodland period.

Introduction

This paper provides an analysis of ceramic artifacts (pottery vessel and smoking pipe fragments) from an early Late Woodland Princess Point complex site known as Cayuga Bridge (AfGx-1). It has three main objectives: (1) to characterize pottery design profiles and smoking pipe forms at Cayuga Bridge in light of recent, substantive excavations at the site; (2) to discuss potential intrasite changes in pottery design preferences across space and through time in view of the stratigraphic profiles found at Cayuga Bridge; and (3) to position the collection analyzed herein within an earlier seriation of Princess Point pottery conducted by André Bekerman (1995).

The Princess Point complex is currently understood to be one of three early Late Woodland regional foci in southwestern Ontario. Sites associated with this complex are principally found along the Grand River and its tributaries but are also known from Burlington Bay, at the western end of Lake Ontario, where the type site was originally documented (see Stothers 1977:29; see also Haines et al. 2011). Princess Point settlements have likewise been recorded in adjacent areas, including Long Point (see, e.g., MacDonald 1986) and along the lower reaches of the Credit River (e.g., Fox 1982; see Figure 1). The complex was originally defined by David Stothers (1977) as a geographically widespread cultural manifestation that extended throughout much of southwestern Ontario. Stothers (1977:122–123) was of the opinion that Princess Point groups were semi-sedentary in nature and practised a seasonal round that included warm-weather macroband settlement in lacustrine and riverine locales, where horticultural activities were pursued, followed by cold-weather microband dispersal to upland environments. Apart from the cultivation of maize, the settlement–subsistence model proposed by Stothers (1977) was essentially a continuation of perceived earlier Middle Woodland lifeways (see Spence et al. 1990). Subsequent to this work, Bill Fox (1982, 1984,

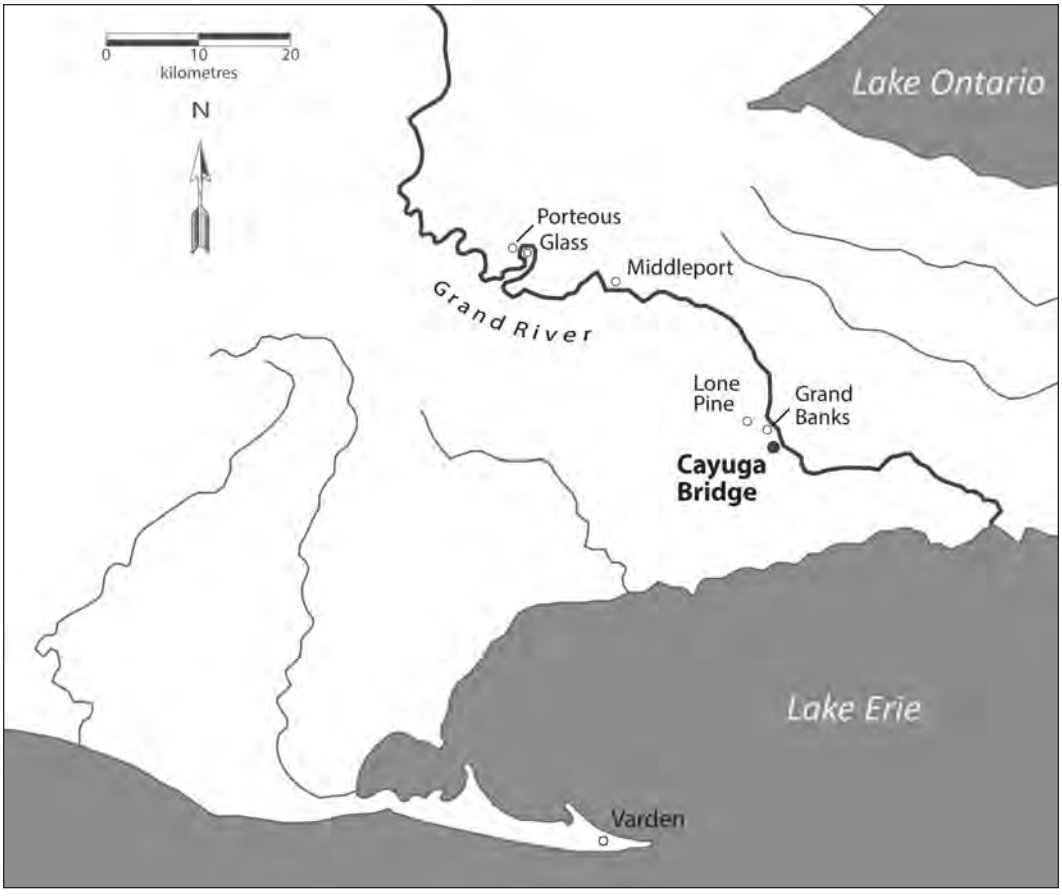

Figure 1. *Location of the Princess Point region, showing sites discussed in the text.*

1990) modified various aspects of the Princess Point taxon, including reducing its areal extent to the region noted above. As well, beginning in 1993, Gary Crawford and David Smith undertook a far-reaching program of survey and excavation involving numerous Princess Point sites (see, e.g., Crawford and Smith 1996; Smith and Crawford 1997), including limited investigations at Cayuga Bridge.

Princess Point pottery has been described by many researchers (e.g., Archaeological Services Inc. 1999; Bekerman 1995; Bursey 1995, 2003; Fox 1990; MacDonald 1986; Noble and Kenyon 1972; Smith and Crawford 1997; Stothers 1974, 1976, 1977) as paddle manufactured and grit tempered; with collarless, everted rims; constricted necks; globular bodies; and semi-conoidal bases. Decoration consists primarily of cord-wrapped implement impressions arranged in horizontal bands or plaits on the interior, lip, and exterior surfaces above the shoulder. Punctates are also found, principally on vessel exteriors, with corresponding raised surfaces (bosses) on the interior. Undecorated vessels, excluding those with exterior cord-roughened surface treatments, are also common among assemblages and would appear to increase in frequency through time. Only a small number of smoking pipes have been documented. These often appear in cross-section to have round or D-shaped stems, right- to obtusely angled elbows, and barrel-like or cylindrical bowls. These pipes can be undecorated or contain rows of punctates and/or incised decorative elements.

In the remainder of this paper, in keeping with the objectives identified above, I briefly describe the results of a ceramic artifact analysis conducted on Princess Point materials excavated at Cayuga Bridge by New Directions Archaeology. I begin by reviewing the archaeology of the Cayuga Bridge site and follow this by a brief discussion of the methods employed in this work. I then present the results of the analysis, before turning my attention to a discussion of pottery trends as suggested by the sample.

The Cayuga Bridge Site (AfGx-1)

The Cayuga Bridge site is a large, stratified settlement located on a lateral bar (floodplain) of the Grand River near Cayuga, Ontario. While its areal extent is not known, Crawford and Dieterman (1999:2) have suggested that it may extend over much of the floodplain. As with other sites found in such settings, Cayuga Bridge betrays a complex geomorphology, associated with the fluvial dynamics of the Grand River and changing water levels in Lake Erie (for a detailed discussion, see Crawford et al. 1998; Walker et al. 1997). Essentially, in the lower reaches of the Grand River valley, where Cayuga Bridge is found, paleosols formed during two periods of relative stability when floodplain aggradation was minimal. Based on detailed geomorphological reconstruction at the Grand Banks site, some 1.5 km north of Cayuga Bridge, the first of these paleosols (PI) formed around 3200 RCYBP, during the Late Archaic, while the second (PII) dates to ca. 1500 RCYBP, during the early Late Woodland, and lasted for some 400 years (e.g., Walker et al. 1997:881–882). It is within the second (upper) paleosol that Princess Point materials are typically found, as described in more detail below. Significant accretion of alluvial sediments can be seen both above and below these horizons.

David Stothers (1977:33) first documented the Cayuga Bridge site in 1970 during the course of his Ph.D. research. At that time, a 10 ft. (3.05 m) long profile was exposed along the river's edge south of the bridge embankment. The areal extent of these excavations is unclear. The site was described by Stothers (1977:33) as consisting of three cultural layers separated by sterile layers of silt (alluvium), with all three layers "represent[ing] the Princess Point Complex at different time periods." Of these layers, only the lowest (Level 4) produced a sizable assemblage of artifacts, including a pit feature and 26 identifiable vessels. These artifacts were not examined by the author as part of this study. Level 4 also produced a conventional radiocarbon date on wood charcoal of 1155 ± 130 B.P. (S-714).

In 1998, Cayuga Bridge was revisited by a team from the University of Toronto Mississauga under the direction of Gary Crawford (Crawford and Dieterman 1999). Working some 20 m north of the bridge and roughly 10 m west of the river's edge, they excavated a 45 m^2 area. Crawford and Dieterman (1999:2–3) portrayed the structure of the site as consisting of alternating layers of alluvium and paleosol. The uppermost layer, A2, is described as being a sterile, grey-brown sandy loam some 100–150 cm in depth. A2 was situated above a compacted and slightly greasy dark brown to black paleosol, P2, some 15 cm in depth and associated with the Princess Point occupation of the floodplain. From a figure depicting the stratigraphic profile of Stothers' excavations at the site (see Stothers 1977:34, Plate II), it seems likely that Crawford and Dieterman's P2 is the same as Stothers' Level 4. Underpinning these layers were an additional zone of yellow-brown alluvium, A1, roughly 50 to 75 cm in depth, followed by the lower paleosol (P1). Crawford and Dieterman (1999:2–3) note that some 11 features, including ash pits and 2 probable hearths, along with 59 posts, were observed on the surface of P2. As well, 5,914 artifacts were catalogued from P2, including pottery sherds decorated with cord-wrapped stick designs, chipped lithics, and faunal remains, with additional materials awaiting processing at the time the licence report was written. The pottery from these excavations was not examined as part of the present study. AMS assays, generated during the course of Crawford and Dieterman's (1999:3) work, produced a date of 1110 B.P. ± 50 (TO-7293) on nutshell, along with two later dates: 980 ± 110 (TO-7445) on nutshell and 120 B.P. ± 50 (TO-7446) on wood charcoal. Both TO-7293 and TO-7445 were recovered from P2, while TO-

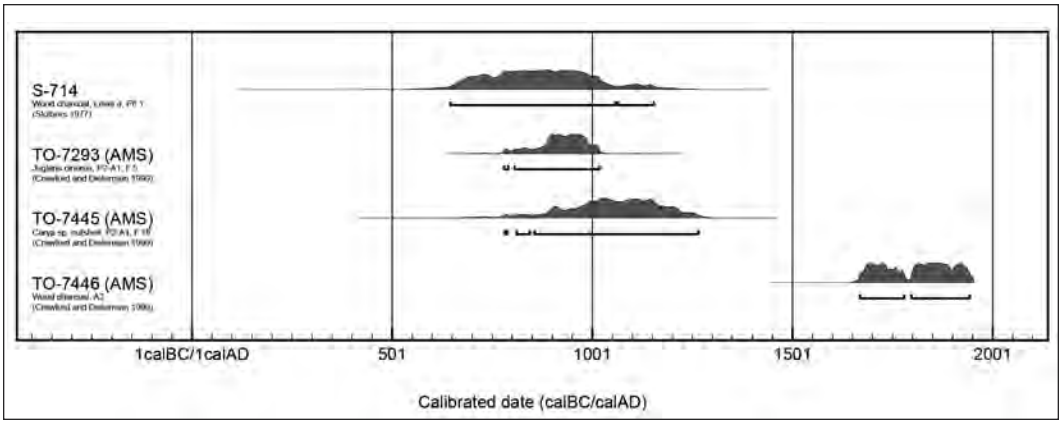

Figure 2. *Calibrated calendrical date ranges for Cayuga Bridge.*

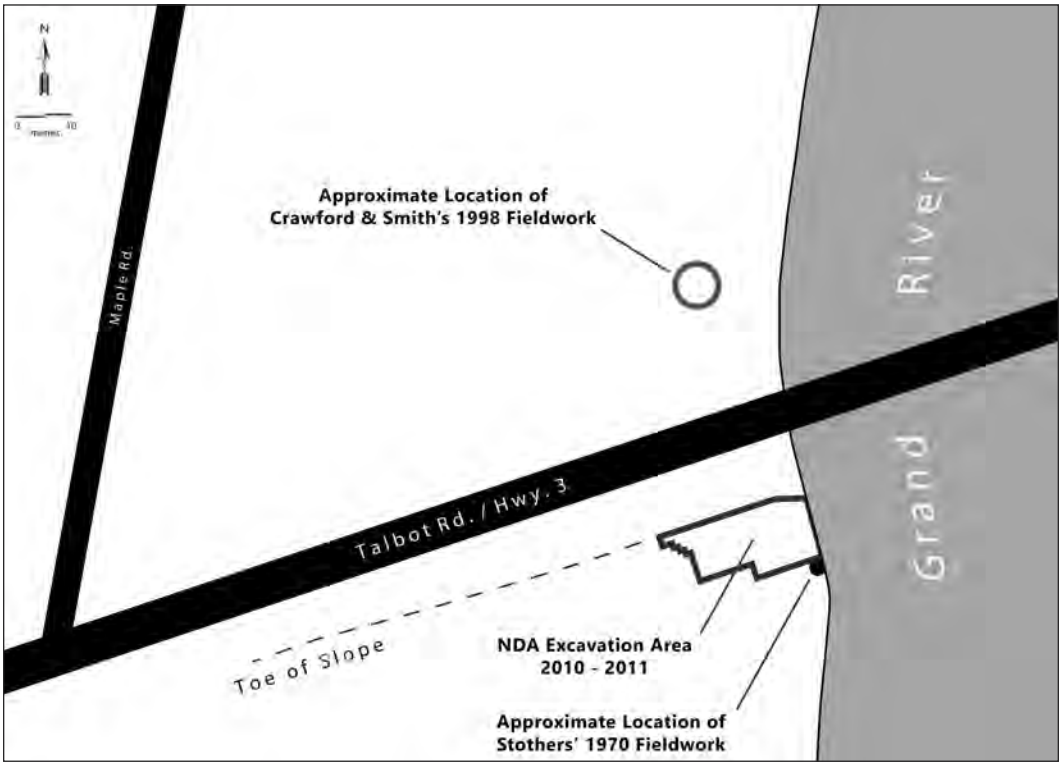

Figure 3. *Excavation locales at Cayuga Bridge.*

7446 was associated with Crawford and Dieterman's A2. These dates, when calibrated at 2σ with the program CALIB 6.0 (Reimer et al. 2009; Stuiver and Reimer 1993), return possible age ranges of between 649 and 1954 cal A.D. When the latest of these dates (TO-7446) is excluded, the 2σ calibrations can be revised to 649–1266 cal A.D. (see Figure 2), which is consistent with the temporal span of Princess Point.

In 2011, New Directions Archaeology (NDA), now part of Archaeological Research Associates, was contracted by the Ontario Ministry of Transportation to excavate a 350 m^2

portion of the site to facilitate the twinning of the Hwy. 3 (Talbot Road) bridge (NDA 2015). These excavations, as depicted in Figure 3, were located immediately south of the bridge, adjacent to the embankment toe-of-slope, and extended to the river's edge. NDA (2015:Table 4) documented as many as 15 stratigraphic levels in this excavation block, which for the most part consisted of layers of alluvial soils interrupted by two principal paleosols, labelled Upper Buried Paleosol II and Lower Buried Paleosol I. Layers 3 and 4 in the southeastern portion of this block and Layers 8 and 9 in the western and northeastern reaches of the excavation relate to the former and, it would seem, to the Level 4 described by Stothers (1977:34) and the P2 documented by Crawford and Dieterman (1999). Meanwhile, the lower buried paleosol is labelled Layer 6 by NDA, and this conforms to the P1 defined by Crawford and Dieterman (1999; see Figure 4). This layer does not appear to have been encountered by Stothers (1977). Three post moulds and eight features attributed to the Princess Point occupation of the site were also documented by NDA (2015:40), and some 298,356 artifacts were recovered.

Of these artifacts, a total of 35,785 ceramic items were examined as part of this study and classified using a code developed by David G. Smith for use with Woodland period ceramics. Some 30,074 of these artifacts (84.04%) were identified as fragmentary vessel sherds on the basis of their small size (< 2cm^2) and were weighed in bulk by provenience unit. A further 4,315 specimens (12.06%) were classified as body sherds, while 19 (0.05%) were recognized as basal sherds, 6 (0.02%) were categorized as shoulder sherds, and 757 (2.11%) were found to be neck or neck/shoulder sherds. Additionally, 569 sherds

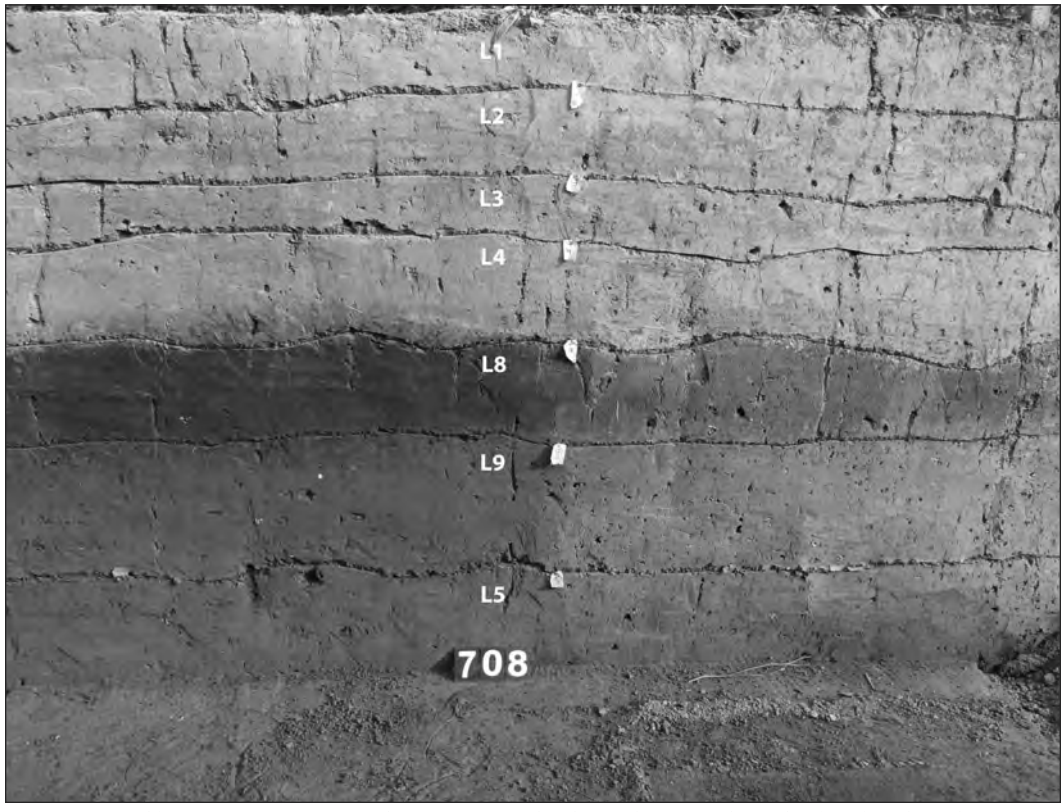

Figure 4. *Profile at 708N, Cayuga Bridge. Layers 8 and 9 depict the "upper buried paleosol," where the majority of Princess Point artifacts in this portion of the excavation area were recovered. Photo courtesy of Phil Woodley.*

(1.59%) were identified as vessel rim sections consisting of interior, lip, and exterior surfaces, either alone or in various combinations. Of these, 226 (0.63%) contain all three surfaces, 175 (0.49%) contain all three surfaces as well as a portion of the vessel neck, and 4 (0.01%) contain all three surfaces as well as a portion of the vessel neck and shoulder. Some of these rim sherds appear in Figures 5–7. The Cayuga Bridge ceramic artifact sample also included 5 examples of juvenile vessels, including 1 complete "pinch pot" (10.03.2.319), as well 29 fragments of smoking pipes, 23 of which were classified as bowl, stem, mouthpiece, or stem/mouthpiece sections. Finally, 10 objects (0.03%) were identified as lumps of clay, while 1 fragment (<0.01%) was categorized as a miscellaneous earthenware object.

Analytical Methods

For the purposes of this study, a ceramic artifact was considered analyzable if it (1) could be identified as a vessel rim sherd containing interior, lip, and exterior surfaces; or (2) could be identified as a bowl fragment from a smoking pipe. Of the 569 vessel rim sherds identified in the Cayuga Bridge sample, 393 were selected for analysis based on the criteria noted in (1) above. These included upper rim specimens (n = 218; 55.47%); upper rim and neck specimens (n = 161; 40.97%); and upper rim, neck, and shoulder specimens (n = 17; 4.3%). Rim sherds displaying an irregular form and/or unskilled decorative treatments were classified as "juvenile" vessels, three of which (including the pinch pot noted above) were included in the sample. Of the 29 pipe fragments noted earlier, 5 were chosen for further analysis according to the criteria noted in (2) above.

Once the study sample was generated, all pottery sherds were organized into analytical units (vessels) by way of a vessel sort. Sorting proceeded by placing all analyzable vessel rim sherds (n = 393) on a table and arranging them first by stratigraphic profile and then by unit, in effect creating a multi-layered "plan view" of the site, to aid in the identification of physical and inferred mends. Physical mends involved the actual fitting together of two fragments, while inferred mends refer to two specimens that are thought to have originated from the same vessel due to close similarities in attributes of form, surface treatment, and decoration but that cannot be physically mended. Both physical and inferred mends between rim sections were then recorded by systematically comparing each sherd with every other sherd on the table. Nineteen mends were observed between 66 sherds, resulting in the identification of 398 vessels, the majority of which (n = 246; 61.8%) originated from Level 9. Once the vessel sort was complete, each specimen was given a unique identifier based on bag numbers contained in the catalogue (e.g., 163.07), followed by layer number (e.g., 9) and, finally, vessel record (e.g., 038). A similar numbering system was applied to the pipe bowl fragments.

Upon completion of the vessel sort, a variety of discrete and continuous variables were employed to describe aspects of rim form and decoration. For each specimen, 10 aspects of rim form were initially examined, including three ratio scale variables (Lip Thickness, Collar Height, and Basal Collar Thickness) and seven nominal scale variables (Castellation Form, Lip Form, Rim Form, Upper Rim Profile, Interior Surface Modification, Lip Surface Modification, and Exterior Surface Modification). Because only poorly defined collars were noted in the sample, in many cases taking the form of folded-over, rolled, or thickened lip surfaces, the variables of Collar Height and Basal Collar Thickness were not measured.

Rim decoration was classified according to interior, lip, and exterior decorative completeness (i.e., the number of observed horizontal bands on each surface), as well as the arrangement of decorative elements into horizontal bands. Smith (1997a:69) defines a decorative element as "an observed individual mark or alteration on the surface of a vessel," and such elements can be broken down into three non-continuous variables: Tool, Technique, and Motif. This procedure resulted in 12 to 28 variables of decoration: Interior Decorative Completeness, Lip Decorative Completeness, and Exterior Decorative Completeness, as well as Tool, Technique, and Motif for each of up to three bands of decoration

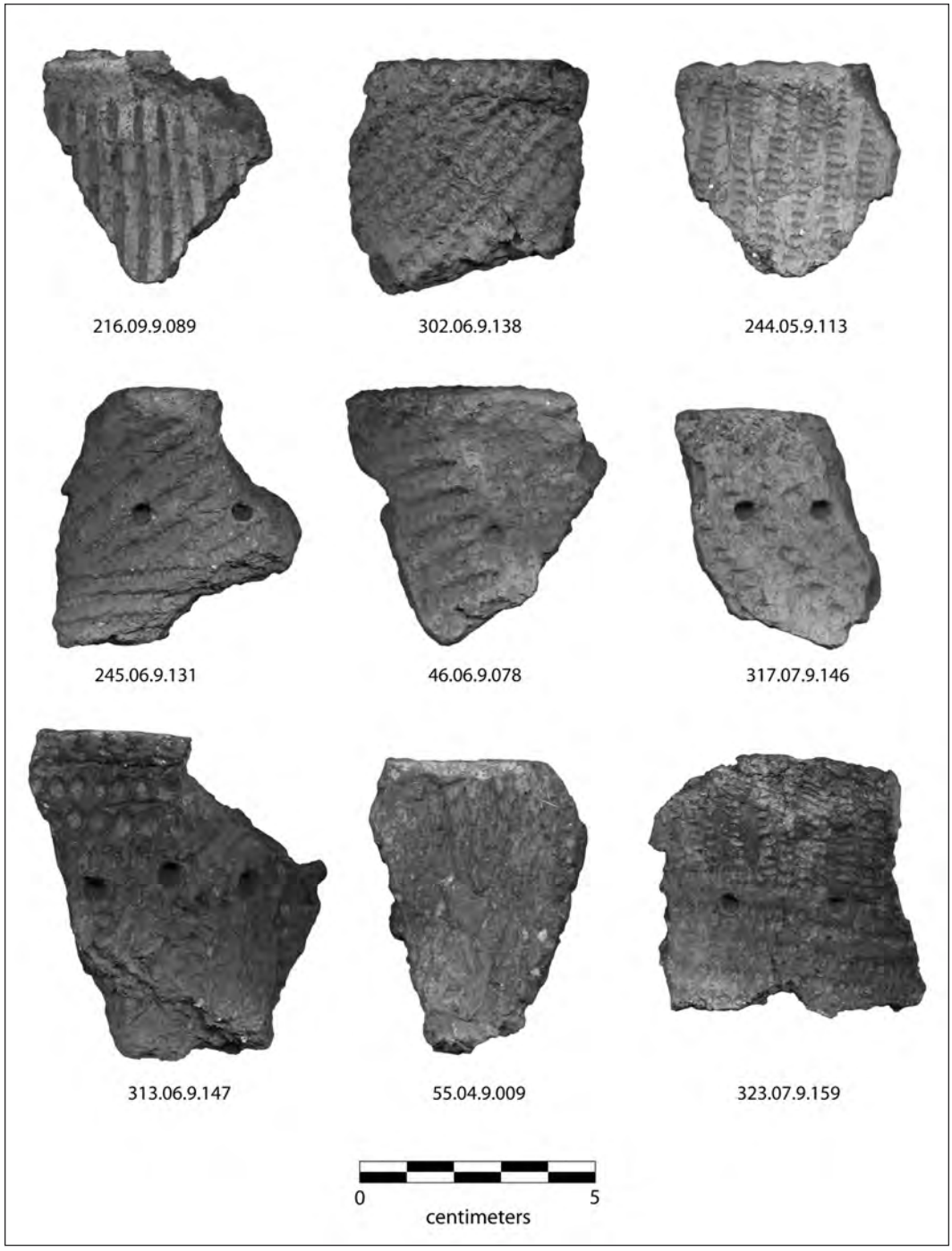

Figure 5. *Selected rim sherds from Level 9 at Cayuga Bridge.*

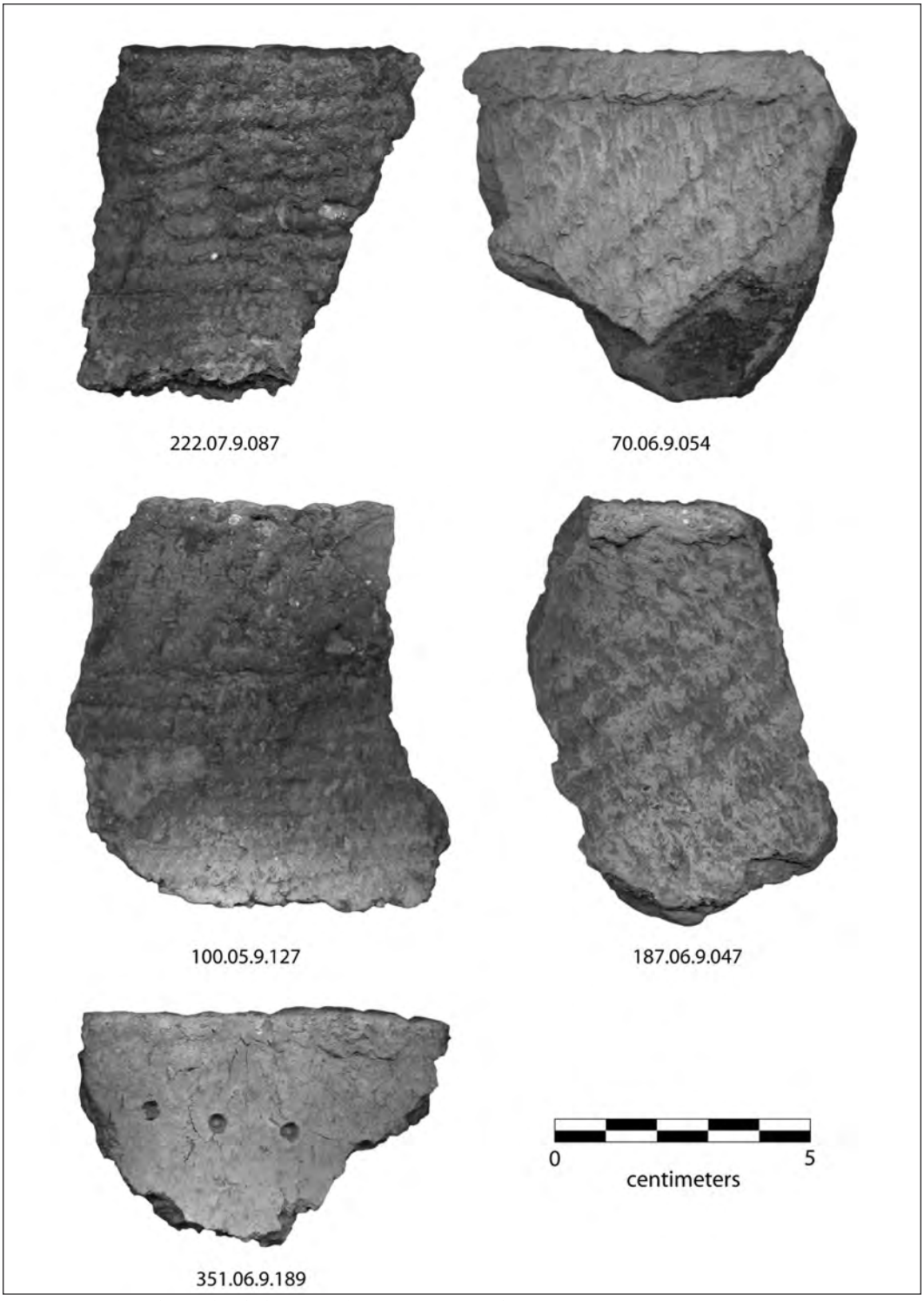

Figure 6. *Selected rim sherds from Level 9 at Cayuga Bridge.*

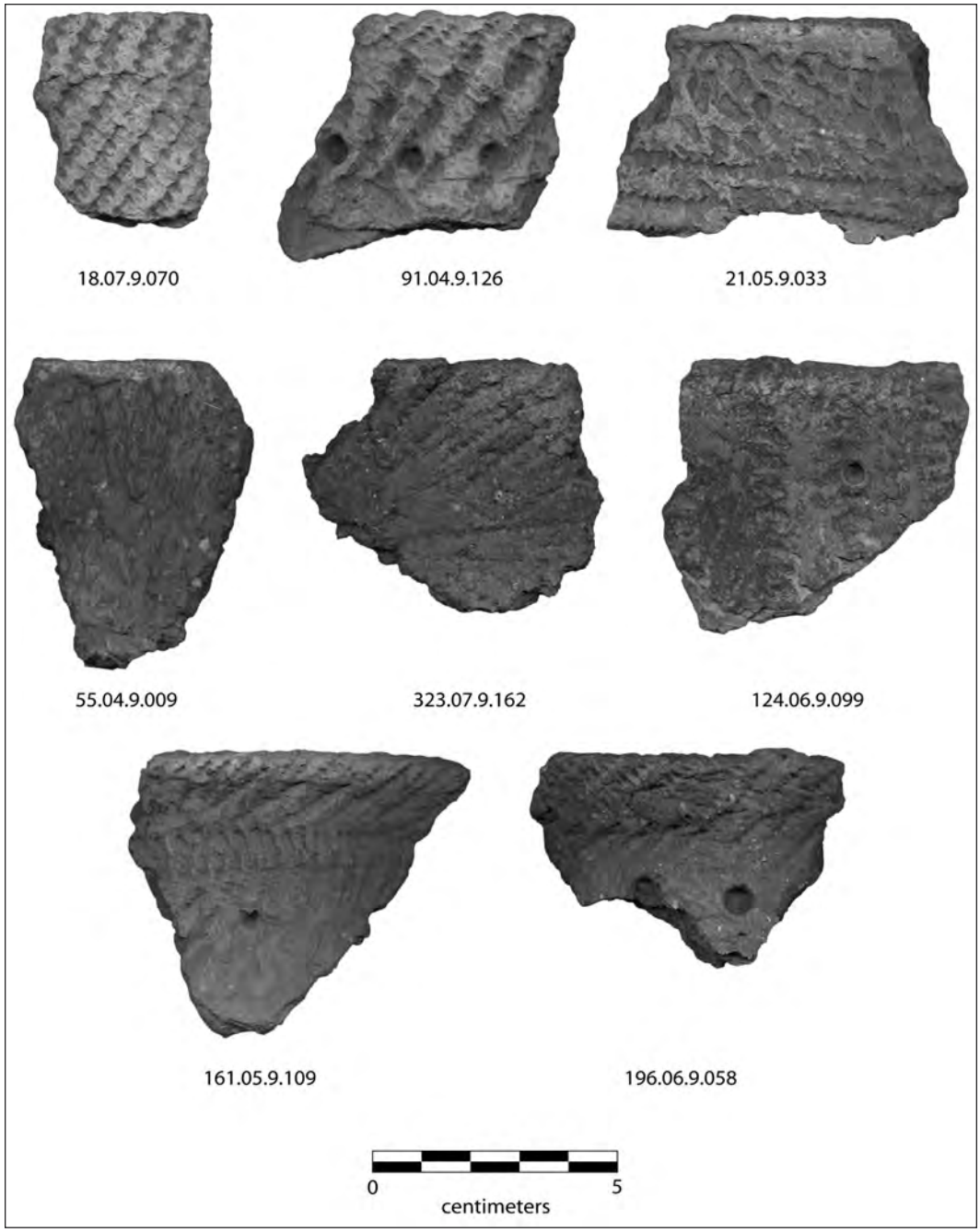

Figure 7. *Selected rim sherds from Level 9 at Cayuga Bridge.*

on the interior, two bands of decoration on the lip, and four bands of decoration on the exterior. While motif can be observed directly, tool use and technique must be inferred from the nature and characteristics of the decorative element. With regard to the variable "Tool," five instruments (pointed, linear/curvilinear, dentate, cord-wrapped, and cord) are recognized; pointed forms may also be further classified into round, elliptical, polygonal, and annular varieties, while linear/curvilinear tools may be further designated as straight, curved, or wavy. As concerns the variable "Technique," impressions are characterized by whether or not they are stamped (parallel, oblique, or perpendicular); incised; trailed; or made with a push-pull, drag-stamp, rocker, or rolled motion. Finally, for the classification of "Motif," linear decorative elements can be broken down into vertical, right oblique, left oblique, dashed, and horizontal examples. Punctates and plaits are classified in a similar fashion, while combinations of elements in the same band, whether created by superimposition or alternation, are classified with the prefix "SUPIMP" or "ALT," respectively.

In addition to variables of form and decoration, five variables were included for the purposes of cataloguing and tracking the specimens: Site Name, Borden Number, Unit Number, Layer, and Vessel Number. Data were entered into an Excel spreadsheet using drop-down lists and user-input values based on the variables of form, decoration, provenience, and nature of the specimen, as noted above. For reference and illustration purposes, digital (.jpeg) images of some vessel exterior surfaces were generated using a flatbed scanner.

Results

Vessel Analysis

Mean rim section (vessel) weight is 14.5 g; the range is 2.1 g to 181.6 g, and the standard deviation is 18.36 g. The vast majority of vessel rims can be characterized as collarless (n = 236; 73.29%), while 67 specimens (20.81%) display a folded-over rim, or "pseudo collar," on the exterior. Some 16 vessels, roughly 5 percent of the sample, contain a thickened upper rim with raised interior and exterior surfaces. Only 2 specimens, or 0.62 percent of the collection, showed evidence of an incipient collar. Exterior vessel rim profiles can be described generally as concave (n = 183; 56.83%); a minority are straight (n = 35; 10.87%), convex (n = 12; 3.73%), or indeterminate (n = 92; 28.57%). Close to two thirds of vessel lips are flat (n = 197; 61.18%), while all but five of the remaining specimens (n = 120; 37.27%) were classified as rounded. Mean lip thickness is 8.55 mm; the range is 3.50 mm to 15.60 mm and the standard deviation is 1.94 mm. Interior surface modification is predominantly smooth (n = 269; 83.54%), with wiped surfaces a distant second (n = 49; 15.22%). The surfaces on 2 specimens are textured or malleated, and those on a further 2 specimens are indeterminate. Lip surface modification is overwhelmingly smooth (n = 307; 95.34%), with only 12 examples (3.73% of the sample) showing signs of texturing or malleation. Three lip surfaces are wiped. Concerning exterior vessel rim surfaces, just over half of the sample (n = 170; 52.80%) is smooth, while some 46 percent of all specimens (n = 149) are textured or malleated. Two examples are wiped, and one is indeterminate.

With regard to vessel decorative completeness, evidence for interior bands is limited; approximately 71 percent of the sample, or 230 vessels, displays only one complete or partial band of decoration. Roughly a quarter of the sample (n = 79; 24.54%) displays two complete or partial bands of decoration, with the remainder evincing three bands, excluding the complete juvenile vessel (i.e., the "pinch pot"), which was treated as a separate category in terms of this and the other decorative completeness variables. Decorative completeness for the lip is excellent; some 310 vessels, or more than 96 percent of the sample, exhibit evidence of tool, technique, and motif. Eleven vessels (3.42% of the sample) contain a partial band of decoration on the lip. Concerning exterior surfaces, decorative completeness is, like interior surfaces, somewhat restricted. Just over two thirds of the vessels (n = 216; 67.08%) contain one complete or partial band of decoration; slightly more than one quarter of the vessels (n = 88; 27.33%) reveal evidence of

two complete or partial bands of decoration; and 17 of the vessels (5.28% of the sample) exhibit three complete or partial bands.

Table 1 presents summary data for Tool, Technique, and Motif combinations on Band 1 interior surfaces, while Table 2 presents a similar summary for Band 2. With regard to Band 1, just over one third of the collection (n = 115; 35.71%) contains a plain Band 1, while some 205 vessels, or 63.66 percent of the sample, shows cord-wrapped implement (CWI) impressions stamped in various orientations. Of these, linear right obliques dominate (n = 111; 34.47), followed by linear verticals (n = 69; 21.43%) and linear left

Table 1. *Interior Band 1 Decoration.*

(Tool x Technique x Motif)	**n**	**%**
Plain x Plain x Plain	115	35.71
CWI x Stamp (Parallel) x		
Linear Left Oblique	25	7.76
Linear Right Oblique	111	34.47
Linear Vertical	69	21.43
Linear (Straight) x Stamp (Parallel) x Linear Vertical	1	0.31
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Bossed Horizontal over Linear Vertical	1	0.31
Total	**322**	**100.00**

Table 2. *Interior Band 2 Decoration.*

(Tool x Technique x Motif)	**n**	**%**
CWI x Stamp (Parallel) x		
Linear Horizontal	1	1.14
Linear Left Oblique	2	2.27
Linear Right Oblique	10	11.36
Linear Vertical	4	4.55
Linear (Straight) x Stamp (Parallel) x Linear Right Oblique	1	1.14
Pointed (Round) x Stamp (Perpendicular) x		
Bossed Horizontal	27	30.68
Punctate Horizontal	3	3.41
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Bossed Horizontal over Linear Right Oblique	1	1.14
Total	**88**	**100.00**

obliques (n = 25; 7.76%). One vessel (294.03.21.294) displays linear tool impressions, stamped parallel to the surface in short, vertical lines, while still another vessel (322.03.3.259) contains raised bosses superimposed over vertical CWI impressions. Concerning Band 2, owing to the smaller number of sherds that contain surfaces below the upper rim, only 88 vessels are represented. Of these, 39 (44.32%) contain no decoration, while 17 (19.32%) display CWI use, including stamped right (n = 10; 11.36%), vertical (n = 4; 4.55%), left (n = 2; 2.27%), and horizontal (n = 1; 1.14%) impressions. Vessel 294.03.21.294, which contains linear tool impressions on Band 1, also displays a similar decorative motif on Band 2, albeit with right obliques as opposed to vertical lines. As well, Band 2 contains ample evidence of pointed tool use in the form of both bossed (n = 27; 30.68%) and punctate (n = 3; 3.41%) horizontal lines. In one instance (73.02.12.278), superimposed decoration takes the form of horizontal bosses over linear right oblique impressions fashioned with a CWI. Finally, 10 vessels exhibit a third band of decoration on the interior, of which 7 are plain, 2 contain horizontal bossing, and 1 displays linear right oblique impressions formed by a CWI.

As regards lip decoration, Table 3 presents similar combinations for the variables Tool, Technique, and Motif. Here, we see a decline in the number of plain surfaces (n = 72; 22.36%) and an increase in the number of motifs displaying CWI use (n = 248; 77.02%) when compared with the first band of the interior. With respect to these configurations, the vast majority (n = 246; 99.19% of CWI use) take the form of stamping parallel to the surface of the vessel, with right obliques (n = 86; 26.71%), horizontal lines (n = 56; 17.39%), left obliques (n = 53; 16.46%), vertical lines (n = 39; 12.11%), and dashes (n = 9; 2.80%) comprising all but three of the orientations. In these three exceptions, stamped CWI decoration has been superimposed in the form of horizontal lines over right obliques, left obliques over horizontal lines, and right obliques over horizontal lines. A CWI was also used on one vessel lip (358.05.9.168) in a push-pull manner to create a linear dash. In another case

Table 3. *Lip Band 1 Decoration.*

(Tool x Technique x Motif)	**n**	**%**
Cord x Stamp (Parallel) x Linear Horizontal	1	0.31
CWI x Push-Pull x Linear Dash	1	0.31
CWI x Stamp (Oblique) x Crescent Horizontal	1	0.31
CWI x Stamp (Parallel) x		
Linear Dash	9	2.80
Linear Horizontal	56	17.39
Linear Left Oblique	53	16.46
Linear Right Oblique	86	26.71
Linear Vertical	39	12.11
SUPIMP Linear Horizontal over Linear Right Oblique	1	0.31
SUPIMP Linear Left Oblique over Linear Horizontal	1	0.31
SUPIMP Linear Right Oblique over Linear Horizontal	1	0.31
Pointed (Annular) x Stamp (Oblique) x Crescent Dash	1	0.31
Total	**322**	**100.00**

Table 4. *Exterior Band 1 Decoration.*

(Tool x Technique x Motif)	**n**	**%**
Plain x Plain x Plain	89	27.64
Cord x Stamp (Parallel) x		
Linear Left Oblique	1	0.31
Linear Right Oblique	3	0.93
Linear Vertical	1	0.31
CWI x Stamp (Parallel) x		
Linear Horizontal	7	2.17
Linear Left Oblique	25	7.76
Linear Right Oblique	117	36.34
Linear Vertical	42	13.04
Plaits Linear Horizontal	1	0.31
Plaits Linear Left Oblique	2	0.62
Plaits Linear Right Oblique	2	0.62
Plaits Linear Vertical	6	1.86
SUPIMP Linear Right Oblique over Linear Horizontal	1	0.31
Linear (Straight) x Incised x		
SUPIMP Linear Horizontal over Linear Vertical	1	0.31
Pointed (Elliptical) x Stamp (Perpendicular) x Punctate Horizontal	1	0.31
Pointed (Round) x Stamp (Perpendicular) x		
Plaits Linear Left Oblique	1	0.31
Punctate Horizontal	9	2.80
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Punctate Horizontal over Linear Horizontal	2	0.62
SUPIMP Punctate Horizontal over Linear Left Oblique	2	0.62
SUPIMP Punctate Horizontal over Linear Right Oblique	5	1.55
SUPIMP Punctate Horizontal over Linear Vertical	1	0.31
SUPIMP Punctate Horizontal over Plaits Linear Left Oblique	2	0.62
SUPIMP Punctate Horizontal over Plaits Linear Vertical	1	0.31
Total	**322**	**100.00**

(76.05.9.042), a CWI was used to obliquely stamp a horizontal series of crescent impressions. Cord was impressed on one vessel (199.06.9.073) lip to create a horizontal line. Finally, in one case (100.05.9.127; see Figure 6), a pointed (annular) tool was stamped obliquely to create a dashed line of crescents.

Table 4 presents summary data related to the variables Tool, Technique, and Motif for Band 1 of vessel exteriors. On this band, we see a slight increase in the number of plain specimens (n = 89; 27.64%) when compared with vessel lips, but still fewer examples than was observed on Band 1 of vessel interiors. But like with vessel lips, we see an almost identical number of stamped designs produced using a CWI (n = 203; 63.04%). By far the most dominant of these designs consists of right obliques (n = 117; 36.34%); a minority consist of verticals (n = 42; 13.04%), left obliques (n = 25; 7.76%), or horizontal lines (n = 7; 2.17%). As well, 11 vessels display plaits produced by CWIs, with vertical impressions the most common orientation (n = 6; 1.86% of sample). One vessel (162.06.8.200) displays superimposed CWI-based stamping in the form of right obliques over horizontal lines, while some 13 vessels show horizontal lines of punctates superimposed over various CWI designs, including right obliques (n = 5; 1.55% of sample), and two each of punctates over left obliques, horizontal lines, and plaits of left obliques. Punctates were also found superimposed over vertical lines and plaits of vertical lines. Also, it would appear that five vessels exhibit cord-based (as opposed to cord-wrapped implement-based) decorative stamping with elements including right obliques (n = 3; 0.93% of sample), left obliques and vertical lines (the latter two represented by one vessel each). Turning to other tool use on this band, we see 11 examples of pointed tools (10 round and 1 elliptical) used to create horizontal rows of punctates and, in one case (160.05.8.194), plaits of left obliques. Finally, as with Bands 1 and 2 of interior surfaces, there is one example here (89.05.9.032) of a linear tool used to incise discontinuous lines, in this case creating a superimposed pattern of horizontal lines over vertical impressions.

Some 105 vessels were found to contain a Band 2 on their exterior surfaces (Table 5), of which only 11 (10.48%) are undecorated. The remaining vessels are dominated by CWI stamping (n = 50; 53.19% of the decorated sample), including impressions of right obliques (n = 18; 17.14%), horizontal lines (n = 13; 12.38%), vertical lines (n = 9; 8.57%), left obliques (n = 5; 4.76%), and dashed lines (n = 1). Three examples of plaits were also noted among vessels with CWI use; two of these are made up of right obliques, while one is made up of vertical lines. In one instance (355.05.9.169), CWI decoration on this band took the form of a herringbone pattern with alternating plaits of left and right oblique lines. But cord-wrapped implement designs can also be seen to jump (n = 66; 62.85%) when we consider superimposed decoration, which primarily exhibits patterns of punctates over CWI impressions, including horizontal lines (n = 7; 6.67%) and right obliques (n = 4; 3.81%). Punctates were also found in individual cases to overlay (1) plaits of left obliques; (2) right obliques, which themselves are superimposed over horizontal lines; and (3) alternating arrangements of left and right obliques. In two cases, bosses are superimposed over horizontal lines of cord-wrapped stick impressions. But not all punctates and bosses were found to overlay other decorative forms; 25 vessels (23.80% of the sample) display punctates on their own while one vessel exhibits bosses. As was the case with its interior Band 1 surface, vessel 294.03.21.294 was found to contain linear tool use in the form of stamped right obliques on Band 2 of the exterior.

Finally, eighteen vessels (5.59% of the sample) were found to contain a partial or complete Band 3 on their exterior surfaces; 2 of these vessels are plain, and of the remaining 16 vessels, 10 exhibit evidence of CWI designs, including right obliques (n = 4; 22.22%), left obliques (n = 3; 16.67%), and vertical lines (n = 1). In two cases, horizontal lines of punctates are superimposed over horizontal lines of CWI decoration. In six other cases (33.33%), punctates are present on this band without any underlying decorative elements.

Smoking Pipe Analysis

As noted by both Stothers (1977:59) and Fox (1990:175), ceramic smoking pipes are an uncommon occurrence on Princess Point sites. When they are found, however, they typically display short stems, obtusely to right-angled elbows, and tubular or barrel bowl profiles. While bowls may be smooth or decorated with various incised or stamped motif elements, stems are typically smooth and undecorated, and often taper toward the mouthpiece. One notable exception in the NDA Cayuga Bridge collection is a stem/mouthpiece (328.04) that contains numerous transversely impressed CWI bands.

As noted earlier, 29 ceramic smoking pipe fragments were recovered during the NDA excavations at Cayuga Bridge, of which 5 may be classified as upper bowls, 3 as middle bowls, 2 as elbows, 8 as stems or stems/mouthpieces, and 5 as mouthpieces. Six additional fragments were considered too small to classify. Images of these pipe fragments, excluding 10.03.2.P3, appear in Figure 8.

Table 5. *Exterior Band 2 Decoration.*

(Tool x Technique x Motif)	**n**	**%**
Linear Dash	1	0.95
Linear Horizontal	13	12.38
Linear Left Oblique	5	4.76
Linear Right Oblique	18	17.14
Linear Vertical	8	7.62
Plaits Linear Right Oblique	2	1.90
Plaits Linear Vertical	1	0.95
CWI x Stamp and Twist x Linear Vertical	1	0.95
Linear (Straight) x Stamp (Parallel) x Linear Right Oblique	1	0.95
Pointed (Annular) x Stamp (Perpendicular) x Punctate Horizontal	1	0.95
Pointed (Round) x Stamp (Perpendicular) x		
Bossed Horizontal	1	0.95
Punctate Horizontal	25	23.81
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Bossed Horizontal over Linear Horizontal	2	1.90
SUPIMP Punctate Horizontal over ALT Linear Left/Right Oblique	1	0.95
SUPIMP Punctate Horizontal over Linear Horizontal	7	6.67
SUPIMP Punctate Horizontal over Linear Right Oblique	4	3.81
SUPIMP Punctate Horizontal over Linear Right Oblique over Linear Horizontal	1	0.95
SUPIMP Punctate Horizontal over Plaits Linear Left Oblique	1	0.95
Total	**105**	**100.00**

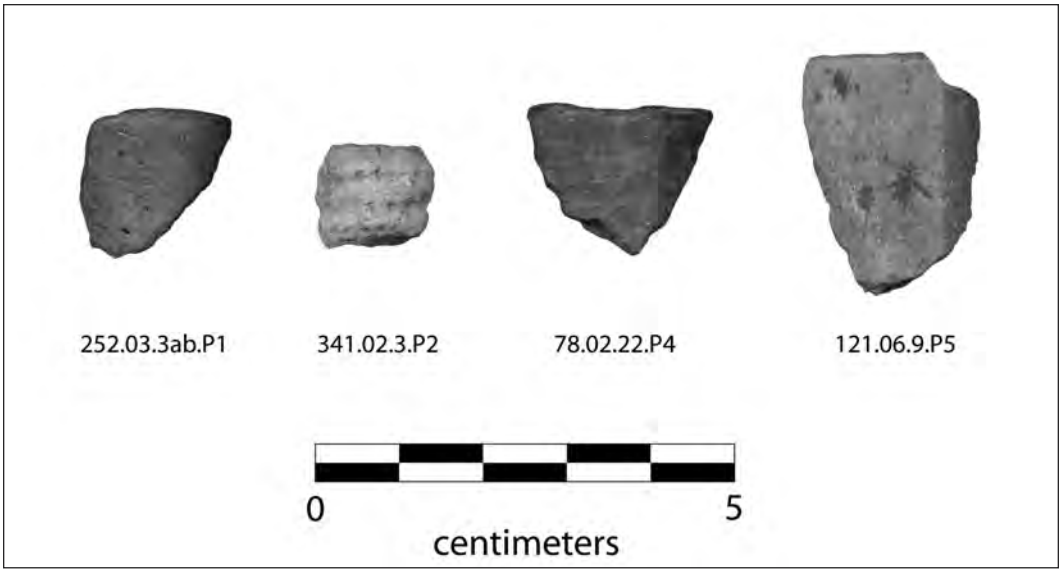

Figure 8. *Pipe bowls from Cayuga Bridge.*

Discussion

Much of what we know about Princess Point complex pottery comes from the work of the late David Stothers (e.g., 1974, 1976, 1977). Employing collections from 10 sites, including Cayuga Bridge, and based on observed similarities in vessel manufacturing techniques and form, Stothers adopted the term "Princess Point Ware" to describe a pottery that is exclusively grit tempered, relatively well fired, and lacking a true collar. Stothers (1977:54–58) believed that other aspects of the ware's design were subject to change over time, such as a shift from medium to fine grit tempering, an improvement in the density and consistency of vessel pastes, and a move from rounded to semi-conoidal bases. With regard to exterior decorative practices, Stothers also believed that certain attributes are temporally significant, including a shift from heavy cord-roughening to smoothed-over cord malleation on vessel bodies and, notably, an increase in plain rims very late in the complex, coupled with an overall decrease in the use of CWIs and punctates. Furthermore, Stothers believed that the relative frequencies of certain motifs and motif elements, such as obliques, obliques over horizontals, chevrons, filled rhombi, and open or filled triangles, were time sensitive and could be used to chronologically seriate regional sites.

Together with available radiocarbon dates and a comparative analysis of stratigraphic profiles from Grand River sites, Stothers (1977:98–104) used these ceramic data to arrive at a seriation that placed Cayuga Bridge in the earliest of three sequential phases (ca. A.D.600–750 [Stothers 1977:113]) along with the Princess Point type site (AhGx-1) in Hamilton and other Grand River sites, namely Glass (AgHb-5), Mohawk Chapel (AgHb-2), and Middleport (AgHa-2). The Grand Banks site (AfGx-3), located some 1.5 km to the north of Cayuga Bridge, was seen as part of a middle phase (ca. A.D. 750–850), while the Porteous site (AgHb-1), on the outskirts of Brantford, was considered to be a late phase occupation (ca. A.D. 850–900) transitional to Early Ontario Iroquoian lifeways. In his review of Middle to Late Woodland radiocarbon dates from southern Ontario, Smith (1997b:48) suggested that the temporal span of Princess Point should be widened to A.D. 500–1030.

Following Stothers' (1977) seriation, Bekerman (1995) carried out a similar analysis, which included five Princess Point sites examined by Stothers (Glass, Cayuga Bridge, Grand Banks,

Table 6. *A Comparison of Select Princess Point Pottery Design Attributes (Exterior - Band 1)*

	Glass		Cayuga Bridge				Middle-port		Varden		Porteous		Lone Pine		Grand Banks	
			Total		NDA											
	n	%	N	%	n	%	n	%	n	%	n	%	n	%	n	%
Plain	1	4.2	4	21.1	89	27.64	1	4.2	4	7.8	28	28.9	7	26.9	9	33.3
Tool: CWI	23	95.8	15	79.0	216*	67.08*	18	66.7	42	82.4	53	54.6	17	65.4	18	66.7
Tech: Stamped	23	95.8	15	78.9	232	72.06	20	87.0	47	92.2	63	65.0	19	73.1	18	66.7
Motif: Vertical	4	16.7	3	15.8	43	13.35	6	26.1	7	13.7	8	8.3	3	11.5	1	3.7
Motif: LO	1	4.2	2	10.5	26	8.07	2	8.7	6	11.8	5	5.2	1	3.9	2	7.4
Motif: RO	17	70.8	9	47.4	120	37.27	12	52.2	30	58.8	46	47.4	12	46.2	15	55.6

Note: CWI = cord-wrapped implement; LO = Linear Left Oblique; RO = Linear Right Oblique; Tech = technique. All data from Bekerman (1995), with the exception of the NDA sample.
*Includes instances of superimposed decoration.

Table 7. *Comparison of Selected Princess Point Pottery Design Attributes (Exterior - Band 2).*

	Glass		Cayuga Bridge				Middle-port		Varden		Porteous		Lone Pine		Grand Banks	
			Total		NDA											
	n	%	N	%	n	%	n	%	n	%	n	%	n	%	n	%
Plain	2	8.3	4	21.1	11	10.5	5	21.7	13	25.5	32	33.0	11	42.3	15	55.6
Tool: CWI	16	66.7	15	79.0	66*	62.9*	16	69.6	32	62.8	43	44.3	9	34.6	12	44.4
Tech: Stamped	22	91.7	13	68.4	94	89.5	17	73.9	36	70.6	52	53.6	13	50.0	12	44.4
Motif: Vertical	0	0.0	1	5.3	9	8.6	1	4.4	0	0.0	4	4.1	0	0.0	0	0.0
Motif: LO	0	0.0	1	5.3	5	4.8	0	0.0	2	3.9	5	5.2	3	11.5	0	0.0
Motif: RO	1	4.2	3	15.8	19	18.1	2	8.7	4	7.8	15	15.5	2	7.7	3	11.1

Note: CWI = cord-wrapped implement; LO = Linear Left Oblique; RO = Linear Right Oblique; Tech = technique. All data from Bekerman (1995), with the exception of the NDA sample.
*Includes instances of superimposed decoration.

Middleport, and Porteous) and two additional sites excavated in the ensuing years: Varden (AdHa-1) on Long Point (MacDonald 1986), and Lone Pine (AfGx-113) in the Grand River valley (see Smith and Crawford 1997:18–20). While Bekerman (1995:33–42) also found that pottery from the Glass and Middleport sites appeared to be early, he suggested that materials from Cayuga Bridge appeared to occupy an intermediate rather than an early position within the relative chronology, followed closely by Grand Banks and Porteous later in time. This interpretation is fairly close to what Stothers had in mind for Cayuga Bridge when he wrote "among the early phase sites there appears to be a strong and consistent tendency for the Glass, Short and Middleport sites to cluster as the earliest group of the early phase sites, with the Mohawk Chapel, Princess Point and Cayuga Bridge sites clustering toward late, early phase times" (Stothers 1977:104).

Despite the conclusions reached by Stothers (1977) and Bekerman (1995) regarding the

position of Cayuga Bridge within the Princess Point chronological sequence, it is difficult to characterize this and other Grand River sites in such a fashion (see Fox 1990:174; Smith and Crawford 1997:124). For one, there are few if any Princess Point pottery samples that can be unambiguously attributed to a brief temporal span. This reservation certainly applies to Cayuga Bridge, as noted earlier, as well as to Grand Banks, where radiocarbon evidence suggests that the site was occupied for a period of 500 years or more (see Crawford et al. 1997:114). It is also likely the case with the Princess Point component at the Middleport site (see Jamieson 1986; cf. Wintemberg 1948). Attempts to identify discrete periods of Princess Point pottery design within an otherwise continuous sequence must also contend with small sample sizes. While this is not the case with the present analysis, which produced 322 vessels, all but one of the Grand River collections used by Bekerman (1995) generated statistically small vessel counts, ranging from 19 at Cayuga Bridge to 27 at Grand Banks, the notable exception being Porteous, with 97 vessels. Additional work at Grand Banks after Bekerman's (1995) study was completed has added to the sample of pottery from this site (see Smith and Crawford 1997:24), but it has not been systematically analyzed. Like Porteous, the Holmedale site (AgHb-191), in Brantford (ASI 1999), is a notable exception to the generally small sample sizes, producing 65 vessels.

While these caveats regarding Princess Point pottery trends should be taken seriously, it is still possible to compare the aggregated NDA collection from Cayuga Bridge with the sample generated by Stothers (1977), along with other Grand River assemblages, all of which were analyzed by Bekerman (1995) using the same pottery code as the one employed here. Along these lines, Tables 6 and 7 present a comparison of selected attributes for the variables tool, technique, and motif for the first two bands of exterior decoration. Additional variables for the interiors and lips of specimens were not recorded by Bekerman (1995) and so cannot be compared here, while the variable rim form cannot be easily examined because different attribute states were used in the present study.

For Band 1, we can see that plain specimens are fairly comparable between the two studies and that while CWI use is considerably higher in the Bekerman (1995) sample, the incidences of stamping are fairly consistent. Similarities are also found in the relative frequencies of several motif elements, including vertical lines and left obliques. The occurrence of right obliques is about 10 percent lower in this study. Where Band 2 is concerned, the number of plain specimens is considerably lower in this study, as is the frequency of CWI use. Stamping, however, is notably higher in the NDA collection. The frequencies of motif elements between the two samples are alike with regard to vertical lines, left obliques, and right obliques. As Bekerman (1995) did not consider punctates or bosses to be aspects of decoration but, rather, part of form, it is difficult to relate the present analysis to his observation that 52.6 percent of the Cayuga Bridge sample was punctated.

As Cayuga Bridge is a stratified site and the rim sherd sample is large, we may also undertake a comparative analysis of intrasite attribute frequencies among three strata: Level 3 (including Levels 3a; 3b; 3a/b; n = 42), Level 8 (n = 29), and Level 9 (n = 246), all of which contain at least one band of interior, lip, and/or exterior decoration. Comparisons are also justified between 16 vessels from Level 3, 11 vessels from Level 8, and 63 vessels from Level 9 that display a second band of interior decoration, and between 14 vessels from Level 3, 10 vessels from Level 8, and 92 vessels from Level 9 that produced a second band of exterior decoration. While it is understood that Layers 3 and 4, in the southeastern portion of the excavation, and Layers 8 and 9, in the western and northeastern reaches of block, relate to the Upper Paleosol, it was nonetheless considered a worthwhile pursuit to explore potential differences in design profiles both across and between the various strata. These data are summarized in Tables 8 through 12.

With regard to rim interiors, as noted in Table 8, we can see that there is a fairly good agreement between Level 3 (n = 42) and Level 9 (n = 246) with regard to the frequencies of CWI tool use (Level 3 = 60%; Level 9 = 60%) and no

Table 8. *Comparison of Interior Band 1 (Tool x Tech x Motif) Decoration from Levels 3, 8, and 9.*

Level 3 (incl. 3a, 3b, 3a/b, 19, 19a, 19b)	**n**	**%**
CWI x Stamp (Parallel) x		
Linear Left Oblique	2	4.76
Linear Right Oblique	10	23.81
Linear Vertical	13	30.95
Plain x Plain x Plain	16	38.10
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Bossed Horizontal over Linear Vertical	1	2.38
Total	**42**	**100.00**
Level 8 (incl. 24b)		
CWI x Stamp (Parallel)		
Linear Left Oblique	2	6.90
Linear Right Oblique	20	68.97
Linear Vertical	3	10.34
Plain x Plain x Plain	4	13.79
Total	**29**	**100.00**
Level 9		
CWI x Stamp (Parallel)		
Linear Left Oblique	17	6.91
Linear Right Oblique	80	32.52
Linear Vertical	50	20.33
Plain x Plain x Plain	99	40.24
Total	**246**	**100.00**

Note: CWI = cord-wrapped implement.

decoration (Level 3 = 38%; Level 9 = 40%) on Band 1. Oddly, and perhaps a function of its much smaller sample size (n = 29), Level 8 displays much higher frequencies of CWI use (86%), with the remainder of the sample consisting of undecorated vessels. Turning to the second interior band of decoration (Table 9) yet keeping in mind the much smaller sample sizes (particularly in Levels 3 and 8) as noted previously, we see some consistency between Levels 3 and 9, to the exclusion of Level 8. CWI use in the former is marginal compared with the latter (6% vs. 19%), and there are more plain specimens in Level 3 (56%) in comparison with Level 9 (46%). Of

note here is the relative agreement between the two levels with regard to the frequency of bossed Band 2 interiors; 38 percent of vessels were so decorated in Level 3 and 32 percent in Level 9 (a figure that rises to 34% if we include instances of punctated interiors). Again, Level 8 seems somewhat out of place here, and this may relate to its relatively small sample size. CWI use and plain specimens are equally represented on this band (45% each), and only one example could be found with bossing (9% of the sample) on Band 2.

Concerning lip decoration (Table 10), there is accord between Levels 3 (n = 42) and 9 (n = 56), particularly with respect to the number of plain specimens, but also between both of these levels and Level 8 (n = 29). All three levels produced values ranging between 19 and 23 percent. CWI use dominates the remainder of the decorative repertoire and is also found in comparable frequencies in all three levels, with values falling

Table 9. *Comparison of Interior Band 2 (Tool x Tech x Motif) Decoration from Levels 3, 8, and 9.*

	n	%
Level 3 (incl. 3a, 3b, 3a/b, 19, 19a, 19b)		
CWI x Stamp (Parallel) x Linear Left Oblique	1	6.25
Plain x Plain x Plain	9	56.25
Pointed (Round) x Stamp (Perpendicular) x Bossed Horizontal	6	37.50
Total	**16**	**100.00**
Level 8 (incl. 24b)		
CWI x Stamp (Parallel) x Linear Right Oblique	5	45.45
Plain x Plain x Plain	5	45.45
Pointed (Round) x Stamp (Perpendicular) x Bossed Horizontal	1	9.09
Total	**11**	**100.00**
Level 9		
CWI x Stamp (Parallel) x		
Linear Horizontal	2	3.17
Linear Left Oblique	1	1.59
Linear Right Oblique	6	9.52
Linear Vertical	3	4.76
Plain x Plain x Plain	29	46.03
Pointed (Round) x Stamp (Perpendicular) x		
Bossed Horizontal	20	31.75
Punctate Horizontal	2	3.17
Total	**63**	**100.00**

Note: CWI = cord-wrapped implement.

Table 10. *Comparison of Lip Band 1 (Tool x Tech x Motif) Decoration from Levels 3, 8, and 9.*

Level 3 (incl. 3a, 3b, 3a/b, 19, 19a, 19b)	**n**	**%**
CWI x Stamp (Parallel) x		
Linear Dash	3	7.14
Linear Horizontal	3	7.14
Linear Left Oblique	9	21.43
Linear Right Oblique	9	21.43
Linear Vertical	9	21.43
SUPIMP Linear Left Oblique over Linear Horizontal	1	2.38
Plain x Plain x Plain	8	19.05
Total	**42**	**100.00**
Level 8 (incl. 24b)		
CWI x Stamp (Parallel) x		
Linear Dash	1	3.45
Linear Horizontal	3	10.34
Linear Left Oblique	4	13.79
Linear Right Oblique	13	44.83
Linear Vertical	2	6.90
Plain x Plain x Plain	6	20.69
Total	**29**	**100.00**
Level 9		
Cord x Stamp (Parallel) x Linear Horizontal	1	0.41
CWI x Push-Pull x Linear Dash	2	0.81
CWI x Stamp (Oblique) x		
Crescent Horizontal	1	0.41
Linear Horizontal	1	0.41
CWI x Stamp (Parallel) x		
Linear Dash	2	0.81
Linear Horizontal	63	25.61
Linear Left Oblique	33	13.41
Linear Right Oblique	57	23.17
Linear Vertical	28	11.38
SUPIMP Linear Horizontal over Linear Right Oblique	1	0.41
Plain x Plain x Plain	56	22.76
Pointed (Annular) x Stamp (Oblique) x Crescent Dash	1	0.41
Total	**246**	**100.00**

Note: CWI = cord-wrapped implement.

Table 11. *Comparison of Exterior Band 1 (Tool x Tech x Motif) Decoration from Levels 3, 8, and 9.*

Level 3 (incl. 3a, 3b, 3a/b, 19, 19a, 19b)	**n**	**%**
Cord x Stamp (Parallel) x Linear Left Oblique	1	2.38
CWI x Stamp (Parallel) x		
Linear Left Oblique	1	2.38
Linear Right Oblique	11	26.19
Linear Vertical	9	21.43
Plaits Linear Right Oblique	1	2.38
Plaits Linear Vertical	1	2.38
Plain x Plain x Plain	14	33.33
Pointed (Round) x Stamp (Perpendicular) x		
Punctate Horizontal	2	4.76
Plaits Linear Left Oblique	1	2.38
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Punctate Horizontal over Linear Left Oblique	1	2.38
Total	**42**	**100.00**
Level 8 (incl. 24b)		
Cord x Stamp (Parallel) x Linear Right Oblique	1	3.45
CWI x Stamp (Parallel) x		
Linear Horizontal	4	13.79
Linear Left Oblique	2	6.90
Linear Right Oblique	6	20.69
Linear Vertical	6	20.69
Plaits Linear Left Oblique	1	3.45
SUPIMP Linear Right Oblique over Linear Horizontal	2	6.90
Plain x Plain x Plain	7	24.14
Total	**29**	**100.00**

Note: CWI = cord-wrapped implement.

between 77 and 81 percent. Similar patterns are observable when we drill down to the various motif elements displayed; all three levels yielded rims with discontinuous horizontal, left oblique, vertical, and right oblique lines, albeit in somewhat differing frequencies. That there is slightly more variability in Level 9 is suggested by the presence of 4 specimens with different tool

Table 11. *Continued.*

Level 9	n	%
Cord x Stamp (Parallel) x		
Linear Right Oblique	2	0.81
Linear Vertical	1	0.41
CWI x Stamp (Parallel) x		
Linear Horizontal	6	2.44
Linear Left Oblique	14	5.69
Linear Right Oblique	104	42.28
Linear Vertical	23	9.35
Plaits Linear Horizontal	1	0.41
Plaits Linear Vertical	6	2.44
Linear (Straight) x Incised x		
SUPIMP Linear Horizontal over Linear Vertical	1	0.41
Plain x Plain x Plain	73	29.67
Pointed (Elliptical) x Stamp (Perpendicular) x Punctate Horizontal	1	0.41
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Punctate Horizontal over Linear Horizontal	2	0.81
SUPIMP Punctate Horizontal over Linear Right Oblique	4	1.63
SUPIMP Punctate Horizontal over Linear Vertical	1	0.41
SUPIMP Punctate Horizontal over Plaits Linear Left Oblique	6	2.44
SUPIMP Punctate Horizontal over Plaits Linear Vertical	1	0.41
Total	**246**	**100.00**

Note: CWI = cord-wrapped implement.

and/or technique uses (e.g., the use of cord, oblique stamping, and crescent motifs), yet this hardly seems notable given the presence of 246 vessels in this component.

Moving to an examination of vessel exteriors (Tables 11 and 12), we see the data from Band 1 suggest that there is slightly more agreement between Levels 3 and 9 than when either is compared with Level 8. For example, in Level 3, CWI use comes in at 57 percent (60% with the addition of one vessel with superimposed decoration) and in Level 9 it is 64 percent (70% with the addition of vessels with superimposed decoration). In Level 8, CWI use stands at 76 percent, with no examples of decorative elements superimposed upon one another. Whether or not these patterns are meaningful can be debated, especially if we look more closely at the elements. Level 9, for example, is dominated by specimens with linear right oblique lines (42%), at almost twice the relative frequency of either Level 3 or Level 8. Arguing against any kind of difference

Table 12. *Comparison of Exterior Band 2 (Tool x Tech x Motif) Decoration from Levels 3, 8, and 9.*

Level 3 (incl. 3a; 3b; 3a/b; 19, 19a, 19b)	**n**	**%**
CWI x Stamp (Parallel) x		
Linear Horizontal		
Linear Vertical	2	14.29
Linear Right Oblique	1	7.14
Pointed (Round) x Stamp (Perpendicular) x Punctate Horizontal	4	28.57
SUPIMP Pointed (Round) over CWI	4	28.57
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Punctate Horizontal over ALT Linear Left/Right		
Oblique	2	14.29
SUPIMP Punctate Horizontal over Linear Horizontal	1	7.14
Total	**14**	**100.00**
Level 8 (incl. 24b)		
CWI x Stamp (Parallel) x		
Linear Right Oblique	2	20.00
Linear Vertical	1	10.00
Pointed (Round) x Stamp (Perpendicular) x Punctate Horizontal	3	30.00
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Punctate Horizontal over Linear Horizontal	1	10.00
SUPIMP Punctate Horizontal over Linear Right Oblique	3	30.00
Total	**10**	**100.00**

between the three levels would be vessels exhibiting a plain Band 1. These are fairly comparable (33% for Level 3, 24% for Level 8, and 30% for Level 9), although it could be said, again, that there is slightly more congruence between Levels 3 and 9. Looking at Band 2 of the exterior, we see a fairly high yet inconsistent use of punctates between the three levels: 29 percent of the Level 3 vessels are so decorated (50% when examples of superimposed decoration are considered), 30 of the Level 8 vessels (70%, again, if we add examples of punctates over other elements), and 24 percent of the Level 9 vessels (or 37% when punctates are combined with other elements). The significance of these discrepancies, if any, may be mitigated by the small sample sizes for this band in Level 3 (n = 14) and Level 8 (n = 10). Equally equivocal is the variability of CWI decorative elements in the Level 9 sample. These data may be meaningful, but it is difficult to tell given how few specimens there were associated with Levels 3 and 8. Notably, linear right oblique lines are well represented in all three samples of vessels with CWI decoration.

Table 12. *Continued.*

Level 9	**n**	%
CWI x Stamp (Parallel) x	1	1.09
ALT Plaits Linear Left / Linear Right Oblique	19	20.65
Linear Horizontal	3	3.26
Linear Left Oblique	19	20.65
Linear Right Oblique	6	6.52
Linear Vertical	3	3.26
CWI x Stamp and Twist x Linear Vertical	1	1.09
Plain x Plain x Plain	5	5.43
Pointed (Annular) x Stamp (Perpendicular) x Punctate Horizontal	1	1.09
Pointed (Round) x Stamp (Perpendicular) x		
Bossed Horizontal	1	1.09
Linear Horizontal	1	1.09
Punctate Horizontal	20	21.74
SUPIMP Pointed (Round) over CWI		
SUPIMP Stamp (Perpendicular) over Stamp (Parallel)		
SUPIMP Bossed Horizontal over Linear Horizontal	1	1.09
SUPIMP Punctate Horizontal over Linear Horizontal	8	8.70
SUPIMP Punctate Horizontal over Linear Right Oblique	2	2.17
SUPIMP Punctate Horizontal over Plaits Linear Left Oblique	1	1.09
Total	**92**	**100.00**

In short, the comparative analysis of rim sherd decorative attributes among Levels 3, 8, and 9 would seem to suggest that there is little spatial or temporal variability within the Cayuga Bridge excavation block excavated by NDA. If Stothers (1977) and Bekerman (1995) were correct in their assertion that the frequency and uniformity of Princess Point pottery decoration declines through time, as suggested, for example, by a high of 96 percent exterior decoration on Band 1 at Glass, to a range from 66 to 73 percent at such sites as Grand Banks, Porteous, and Lone Pine (see Bekerman 1995:33–36), the present analysis would also argue against an early phase placement for Cayuga Bridge, assuming of course that Levels 8 and 9 at Cayuga Bridge represent relatively short-term occupations without much of an interregnum. This assertion also aligns reasonably well with the available radiocarbon evidence described earlier and depicted in Figure 2. Similarly, if the dominance of stamped decorative motifs is any indication of an earlier rather than a later placement within the design continuum, as suggested by Bekerman (1995:33–35), then Cayuga Bridge would gravitate more toward the former end than the latter.

Conclusions

To conclude, the 322 vessels analyzed as part of

the NDA investigations at the Cayuga Bridge site provide a wealth of new information related to Princess Point pottery manufacture and design and address concerns raised by Smith and Crawford (1997:24) that our understanding of Princess Point complex ceramic designs has, to date, stemmed from small sample sizes. As described above, attribute analyses paint a picture of Princess Point potting practices at Cayuga Bridge as being dominated by CWI use on interior, lip, and exterior surfaces. These tools were used to stamp discontinuous lines made up of primarily right, vertical, and left obliques into horizontal bands across all three surfaces of the vessel, although a number of vessel surfaces were plain. Notable as well is the frequent use of punctates on exterior surfaces, which are typically superimposed over existing decoration. On interior surfaces, decoration is primarily confined to the upper reaches of the vessel (immediately below the lip), while on exterior surfaces, there is a tendency in the sample for the area below the lip to be left plain. With these patterns on display, it can be said that the Cayuga Bridge collection is without question Princess Point in nature and scope. However, it remains somewhat unclear, given the imprecise radiocarbon determinations from the site (and the lack of dates from many components) where exactly Cayuga Bridge can be placed along a continuum of Princess Point pottery design developments. Both the aggregated and comparative analyses performed on design attributes would seem to suggest a position for this site within the latter half of the complex, if design trends as noted by Stothers (1977) and Bekerman (1995) are accepted, meaning that the various strata identified during the excavation were occupied over a relatively short period of time. This interpretation is supported by the intrasite analyses conducted across and between Levels 3, 4, 8, and 9 at the site, as described above, which show only limited variability in attribute frequencies. Overall, the newly expanded Cayuga Bridge pottery sample has provided an exciting opportunity to examine detailed information on Princess Point vessel morphology and decorative styles, to compare frequencies of vessel decorative elements across secure intrasite contexts, and to revisit our understanding of early Late Woodland design trends in the region.

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References Cited

Archaeological Services Inc. (ASI)

1999 The Holmedale Site (AgHb-191): A Settlement on the Grand River: Stage 4 Report on the Salvage Excavation of the Holmedale Water Treatment Plant Upgrade, Brantford Public Utilities Commission, City of Brantford, Ontario. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto. Copies available from OMTCS, Toronto.

Bekerman, André

1995 Relative Chronology of Princess Point Sites. M.Sc. research paper, Department of Anthropology, University of Toronto.

Bursey, Jeffrey A.

1995 The Transition from the Middle to Late Woodland Periods: A Re-Evaluation. In *Origins of the People of the Longhouse,* edited by André Bekerman and Gary A. Warrick, pp. 43–54. Ontario Archaeological Society, Toronto.

2003 Discerning Storage and Structures at the Forster Site: A Princess Point Component in Southern Ontario. *Canadian Journal of Archaeology* 27:191–233.

Crawford, Gary W., and Frank Dieterman
1999 The 1998 Princess Point Project Field Season at Cayuga Bridge (AfGx-1). Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto. Copies available from OMTCS, Toronto.

Crawford, Gary W., and David G. Smith
1996 Migration in Prehistory: Princess Point and the Northern Iroquoian Case. *American Antiquity* 61:782–790.

Crawford, Gary W., David G. Smith,
Joseph R. Desloges, and Anthony M. Davis
1998 Floodplains and Agricultural Origins: A Case Study in South-Central Ontario, Canada. *Journal of Field Archaeology* 25(2):123–137.

Crawford, Gary W., David G. Smith, and
Vandy Bowyer
1997 AMS Dated Early Late Woodland Corn (Zea mays) from the Grand Banks Site, Ontario, Canada. *American Antiquity* 62:112–119.

Fox, William A.
1982 The Princess Point Concept. *Arch Notes* [newsletter of the Ontario Archaeological Society] 82(2):17–26.
1984 The Princess Point Complex: An Addendum. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 84(5):7–12.
1990 The Middle Woodland to Late Woodland Transition. In *The Archaeology of Southern Ontario to A.D. 1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 171–188. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

Haines, Helen R., David G. Smith, David Galbraith,
and Tys Theysmeyer
2011 The Point of Popularity: A Summary of 10,000 years of Human Activity at the Princess Point Promontory, Cootes Paradise Marsh, Hamilton, Ontario. *Canadian Journal of Archaeology* 35:232–257.

Jamieson, Susan M.
1986 Description and Analysis of the Rim Sherd Assemblage from the 1985 Middleport Site Excavations. Microfiche Report Series No. 373. Canadian Parks Service, Environment Canada, Ottawa.

MacDonald, John D.
1986 The Varden Site: A Multi-Component Fishing Station on Long Point, Lake Erie. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto. Copies available from OMTCS, Toronto.

Murphy, Carl, and Neal Ferris
1990 The Late Woodland Western Basin Tradition of Southwestern Ontario. In *The Archaeology of Southern Ontario to A.D. 1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 189–278. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

New Directions Archaeology (NDA)
2015 Stage 4 Archaeological Excavation of the Cayuga Bridge Site (AfGx-1) for the Highway 3 Grand River Bridge Replacement G. W. P. 3501-01-00. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto. Copies available from OMTCS, Toronto.

Noble, William C., and Ian T. Kenyon
1972 Porteous (AgHb-1): A Probable Early Glen Meyer Village in Brant County, Ontario. *Ontario Archaeology* 19:11–38.

Reimer, P. J., Baillie, M. G. L., Bard, E., Bayliss,
A., Beck, J. W., Blackwell, P. G., Bronk Ramsey,
C., Buck, C. E., Burr, G. S., Edwards,
R. L., Friedrich, M., Grootes, P. M., Guilderson,
T. P., Hajdas, I., Heaton, T. J., Hogg, A. G., Hughen,
K. A., Kaiser, K. F., Kromer, B., McCormac,
F. G., Manning, S. W., Reimer, R. W., Richards,
D. A., Southon, J. R., Talamo, S., Turney,
C. S. M., van der Plicht, J., and Weyhenmeyer, C. E.
2009 IntCal09 and Marine09 Radiocarbon Age Calibration Curves, 0–50,000 Years cal BP. *Radiocarbon* 51:1111–1150.

Smith, David G.
1997a *Archaeological Systematics and the Analysis of Iroquoian Ceramics: A Case Study for the Crawford Lake Area, Ontario.* Bulletin No.

15. London Museum of Archaeology, London, Ontario.

1997b Radiocarbon Dating the Middle to Late Woodland Transition and Earliest Maize in Southern Ontario. *Northeast Anthropology* 54:37–73.

Smith, David G., and Gary W. Crawford

1997 Recent Developments in the Archaeology of the Princess Point Complex in Southern Ontario. *Canadian Journal of Archaeology* 21:9–32.

Spence, Michael W., Robert H. Pihl, and Carl R. Murphy

1990 Cultural Complexes of the Early and Middle Woodland Periods. In *The Archaeology of Southern Ontario to A.D.1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 125–169. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

Stothers, David M.

1974 The Glass Site, AgHb-5, Oxbow Tract, Brantford Township, Ontario. *Ontario Archaeology* 21:37–45.

1976 The Princess Point Complex: A Regional Representative of an Early Late Woodland Horizon in the Great Lakes area. In *The Late Prehistory of the Lake Erie Drainage Basin: A 1972 Symposium Revisited,* edited by David S. Brose, pp. 137–146. Cleveland Museum of Natural History, Cleveland.

1977 *The Princess Point Complex*. Mercury Series Paper No. 58. Archaeological Survey of Canada, National Museum of Man, Ottawa.

Stuiver, Minze, and Paula J. Reimer

1993 Extended 14C Database and Revised CALIB Radiocarbon Calibration Program. *Radiocarbon* 35:215–230.

Walker, Ian J., Joseph R. Desloges, Gary W. Crawford, and David G. Smith

1997 Floodplain Formation Processes and Archaeological Implications at the Grand Banks Site, Lower Grand River, Southern Ontario. *Geoarchaeology* 12:865–887.

Wintemberg, W. J.

1948 *The Middleport Prehistoric Village Site.* Bulletin No. 109. National Museum of Canada, Ottawa.

Les fouilles archéologiques entreprises au site du pont Cayuga (AfGx-1), menées en 2011 par New Directions Archaeology, ont révélé une collection considérable de plus de 35 000 artéfacts en céramique pouvant être liés au Princess Point complex du Sylvicole supérieur, période datant de 500 à 1000 ans avant notre ère (AD). Parmi ces artéfacts, 322 récipients en céramique et une variété de pipes ont été identifiés et analysés par l'auteur, qui a également procédé aux éléments suivants : 1) l'interprétation des profils de conception propre au site; 2) l'évaluation de la collection afin de déceler toute variabilité au sein du site même; et 3) le positionnement des caractéristiques de conception du pont Cayuga dans le contexte de la création de céramique dans le temps. Cette analyse suggère que les potiers avaient recours à un éventail limité d'outils, de techniques et de motifs pour décorer leurs vases, ce qui permet d'expliquer les profils de conception assez homogènes sur les surfaces intérieures, extérieures et en bordure des artéfacts. En outre, la fréquence de décoration, au même titre que les analyses de radiocarbone disponibles, auraient tendance à placer le site du pont Cayuga dans la seconde moitié de la période Sylvicole supérieure.

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From Grey to Print

Early Archaic Components on the East Don River: Archaeological Investigations of the Edgar and Andridge Sites[1]

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The Edgar and Andridge sites, situated on headwater streams of the east Don River, were salvage excavated by Archaeological Services Inc. between 2003 and 2006. This article summarizes the subsequent analyses of their settlement data and material culture. An environmental reconstruction was undertaken that included examinations of the geomorphological origin of the area, climate, regional soil characteristics, inferred vegetational cover, and availability of floral and faunal resources. These and the site data were then compared with current archaeological understandings of Late Paleo and Archaic lifeways in the general region to interpret the structure and functions of the sites. Even though the Andridge and Edgar sites date to the Early Archaic period and seemingly have two different but complementary functions, they were situated approximately 800 m apart across two small watercourses, suggesting that they are unlikely to have been used concurrently. The occurrence of multiple generalized and specialized areas at earlier sites raises the question whether one or more generalized areas existed near Andridge and Edgar—areas that would have yielded diverse toolkits reflecting a wide range of domestic tasks. The study of the two sites has, nevertheless, yielded additional data concerning the use of landscapes by hunter-gatherer populations who inhabited the north shore of Lake Ontario area during the Early Archaic period.

Introduction

In 2003 and 2006, Archaeological Services Inc. carried out salvage excavations of the Early Archaic Edgar (AlGu-299) and Andridge (AlGu-347) sites, both located on high, level terrain in Block 12, Official Plan Amendment 400, in the City of Vaughan, Regional Municipality of York. Block 12 was bounded by Major MacKenzie Drive on the south, Teston Road on the north, Bathurst Street on the east, and Dufferin Street on the west (Figure 1). The following is a summary of the subsequent analyses of the settlement and material culture recovered during the excavation of the two sites and is drawn from the full licence reports on that work (ASI 2007, 2008). Catalogues with detailed provenience data are available in those

[1] The intent of the From Grey to Print section of *Ontario Archaeology* is to publish significant studies/papers that that, for whatever reason, were not previously published. They are being presented here largely in their original form, without peer review. They have, however, been edited to conform to the journal's house style. In this example, the contribution has been augmented with some selected, more recent references for clarity. The manuscripts on which it is based were originally written in 2007.

Figure 1. *Location of the Edgar and Andridge sites.*

reports. The activities carried out at the two sites at the time(s) of their occupation were assessed by examining the recovered lithic assemblages and by reconstructing their environment. The environmental reconstruction included examinations of the geomorphological origin of the area, climate, regional soil characteristics, inferred vegetational cover, and availability of floral and faunal resources.

Site data were then compared with current archaeological reconstructions of Archaic lifeways in the general region and are evaluated for their importance in understanding Early Archaic cultural development in other parts of southern Ontario. This study has yielded additional data concerning the use of landscapes by hunter-gatherer populations who inhabited the north shore of Lake Ontario area between 9,000 and 10,000 years ago.

Environmental Setting

The sites were situated in a headwaters area for a number of southeastward-flowing tributary channels of the East Don River (Figure 2) near the

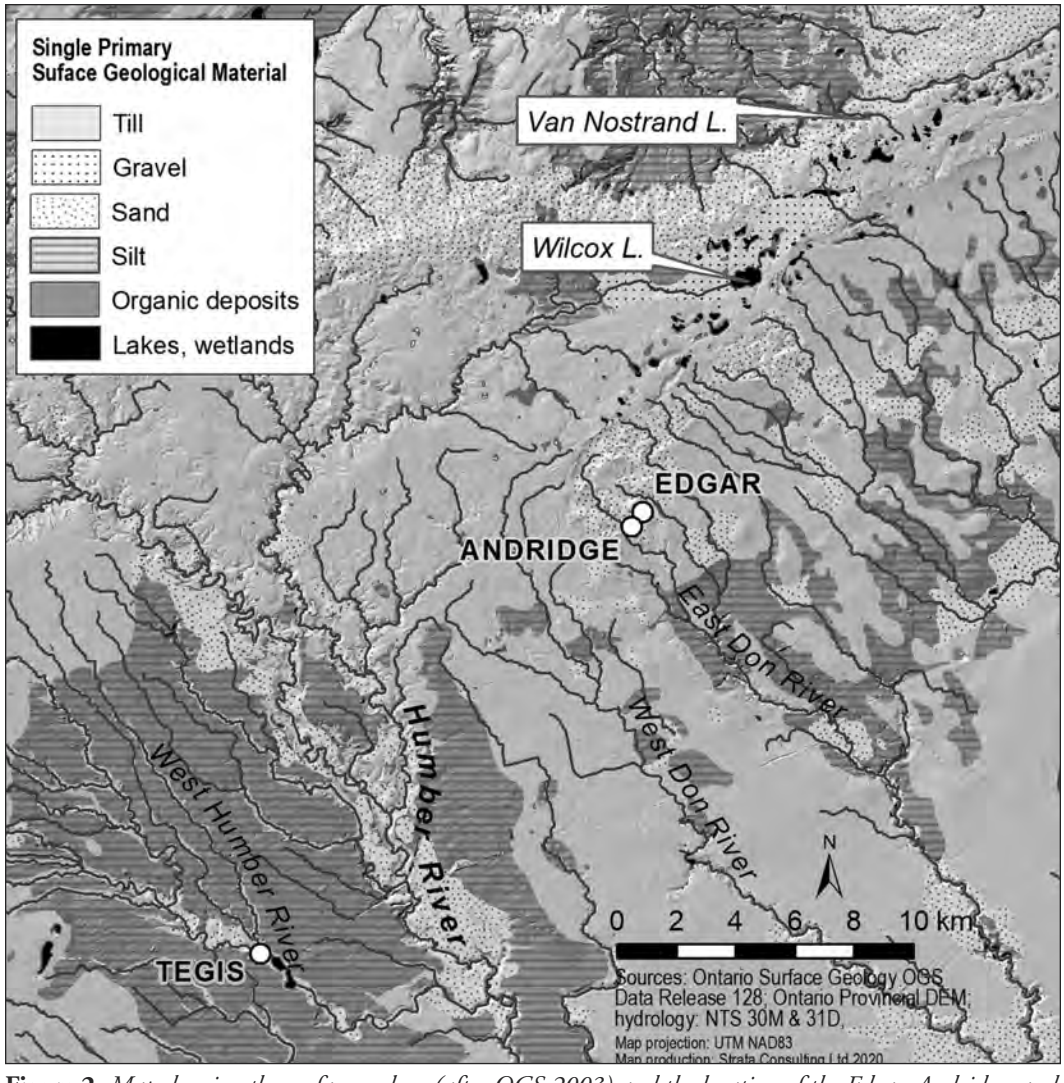

Figure 2. *Map showing the surface geology (after OGS 2003) and the location of the Edgar, Andridge, and Tegis archaeological sites and the Wilcox Lake pollen diagram site. Van Nostrand Lake is located several kilometres northeast of Wilcox Lake.*

base of the south slope of the Oak Ridges Moraine. They are both about 100 m from one of the streams. The soil in the immediate area of the sites is silty Halton Till surrounded by glaciofluvial fine sand and gravel (OGS 2003; Sharpe 1980; Sharpe and Barnett 1997). Downstream, 3 km to the southeast and visible from the sites, are less well-drained glacial lake deposits of silt and clay that extend southeast along the Don and Rouge River systems (Karrow 1970), a legacy of Late Glacial Peel Pondings (Karrow 2005; Sharpe 1980). They may represent former Holocene wetlands. To the north of the site, land rises along the south slope of the Oak Ridges Moraine. At the time of occupation, the water level in the Lake Ontario basin was 80–60 m below present and rising (Anderson and Lewis 1985).

Climate

Pollen evidence used to reconstruct the advance (and retreat) of the pine–spruce ecotone in the Great Lakes area between 13,000–7,500 RCYBP suggests the return of spruce (and a colder climate) to the eastern Georgian Bay area between 9,700–9,400 RCYBP (Anderson and Lewis 2002), near the beginning of the Early Archaic Corner-Notched horizon period. This may be related to lake effect cooling that affected the region downwind of newly formed Lake Superior, or it may relate to the North Atlantic Pre-boreal Oscillation that affected northeastern North America more generally (Yu 2000). Lake effect cooling probably affected the Simcoe lowlands, but it is not clear that the downwind effects would have reached as far southeast as the Oak Ridges Moraine (Anderson and Lewis 2002:Figure 8.7). Mean annual precipitation, calculated from transfer functions, is estimated to have been relatively low but increasing, from about 700 mm to 730 mm between about 10,000 and 9,000 B.P. (Haas and McAndrews 2000:84). The mean annual precipitation for the Richmond Hill area today is 892 mm (Environment Canada 2007). The relative dryness recorded for the early Holocene is consistent with estimates of precipitation from pollen values from the south side of Lake Ontario (Webb et al. 2003).

Vegetation and Lakes

Pollen diagrams from several sites in central southern Ontario indicate that the Early Archaic Corner-Notched horizon period, dating to 9,700–8,900 RCYBP (Ellis et al. 2009:796–801), falls in pollen Zone 2 (McAndrews 1994), at first dominated by jack/red pine (*Pinus banksiana/resinosa*) and later by white pine (*Pinus strobus*).

Tree biomass diagrams (Figure 2) derived from pollen diagrams (McAndrews 1994) for Hams Lake (about 100 km southwest of the sites) and Wilcox Lake (located 8 km northeast of the sites) indicate a mixed forest in southern Ontario for this period (Zone 2b). Table 1 shows ranges for important taxa percentages during the approximate period 10,000–9,500 RCYBP Values for Hams Lake suggest that balsam fir, ash, and elm dominate in this part of southwestern Ontario, with pine, birch, poplar, and oak each constituting at least 10 percent of tree biomass. Ironwood is present, with maple making an appearance at about 9,000 B.P. (McAndrews 1994). Values for Wilcox Lake, in the uplands of the Oak Ridges Moraine just to the north of the sites, suggest greater representation by pine, oak, sugar maple, and possibly ash, with less representation by species that favour wetter substrates, such as fir and elm.

Table 1. *Tree Biomass Percentages for the Early Archaic Corner-Notched Horizon Period.*

Taxon	Hams Lake	Wilcox Lake
Balsam fir (Abies)	10–25	0–10
Pine (Pinus)	5–10	20–35
Birch (Betula)	5–10	0–5
Poplar (Populus)	10	-
Ash (Fraxinus)	15–20	0–25
Oak (Quercus)	10	20
Elm (Ulmus)	10–20	15
Sugar maple (Acer saccharum)	0	20

Note: Calculated from pollen diagrams published by McAndrews (1994), for relatively abundant taxa only (≥ 10%).

Van Nostrand Lake (St Jacques et al. 2000) and Wilcox Lake (Haas and McAndrews 2000; Westgate et al. 1999) are the closest sites to the Edgar and Andridge sites with proxy data for vegetation. A pollen diagram from a 10 m core at van Nostrand Lake supports the interpretation of this period as one dominated by pine with an admixture of birch, oak, and elm, with possibly maple, hemlock, and beech being present (St Jacques et al. 2000:388). Hemlock (Tsuga) had migrated to the Oak Ridges Moraine by 9,000 B.P. (Haas and McAndrews 2000) but did not become dominant until about 7,700 B.P. (St Jacques et al. 2000).

Use-wear analysis of stone tools at the Tegis

site (Figures 1 and 2) suggests, indirectly, the presence and cultural use of several hardwood and softwood taxa, including bitternut hickory (*Carya cordiformis*); white elm (*Ulmus americanus*); and jack pine (*Pinus banksiana*), black spruce (*Picea mariana*), or tamarack (*Larix laricina*) (Burger 1997:19). It should be noted that the serrated projectile points from Tegis may be Late Archaic serrated small points rather than Early Archaic (Ellis et al. 2009:Table 22.3) and that Ellis (2018) and colleagues (Ellis et al. 1991) warn that not all serrated points are necessarily Early Archaic. The presence of other artifacts in the Tegis assemblage like those found on Late Paleo and Early Archaic sites warranted inclusion of the site in a comparative analysis below (Burger 1997:18).

In general, pollen studies from different sites across southern Ontario suggest that well-drained upland areas, including the area around and especially to the north of the sites, were likely covered by a pine forest, with poplar, birch, and oak. Lowland and poorly drained regions, possibly including the glaciolacustrine Peel Ponding deposits, south of the sites, were likely dominated by spruce and fir (McAndrews 2003) and, especially toward the end of the period, black ash (*Fraxinus nigra*) and elm (Bennett 1986; Karrow and Warner 1990).

The terrestrial environment of this period in southern Ontario, in both upland and lowland settings, may have been homogenous, or uniform, relative to that of later periods. In the following millennium (9,000–8,000 B.P.), moisture increased and a greater range of shade-tolerant species emerged, possibly resulting in a patchier or non-uniform forest (Bennett 1986).

Small lakes in the area (such as van Nostrand Lake; Figure 2), as well as in southern Ontario generally at this time, were oligotrophic (nutrient-deprived), possibly because cooler, drier conditions inhibited nutrient cycling and algal growth and because immature forests caused nutrients to be sequestered in the accumulating biomass of the forest rather than to be carried by run-off into lakes (St Jacques et al. 2000:391). This suggests that the quantity or diversity of fish species available for exploitation was limited compared with the later Holocene. On the other hand, it is likely that most of the modern complement of Great Lakes species of economically significant fish had migrated into the Huron basin from Atlantic and Mississippi basin refugia as early as 11,800 (Tomenchuk 1997:122).

Fauna and Subsistence

A review of proboscidean reports from 88 sites in southern Ontario and fossil pollen evidence from the sites suggests that mammoths and mastodons do not post-date Zone 1 (spruce woodland; roughly 10,000 B.P.; McAndrews and Jackson 1988). The largest mammal resources available to Early Archaic hunters in this and other areas of northeastern North America were probably, therefore, some combination, or all, of elk, moose, caribou, and deer (Robarts 1985). In general, the fauna was essentially modern (Ellis et al. 1998). This period is, however, poorly documented. The report of fossil elephants in the Hudson Bay lowlands, which became ice-free only after 8,000 B.P., suggests the very remote possibility of survival of megafauna into the early Holocene (Bell 1898; see also Laub 2006).

If wetlands developed on glacial lake deposits that extend on either side of the Don and Rouge Rivers south of the two sites, this region south of the Oak Ridges Moraine would have been a productive environment for human settlement, supporting a variety of plants and animals during the Early Archaic, similar to the "glacial lake basin mosaic wetlands" (Nicholas 1988) that are believed to support intensive Early Archaic settlement in New England at sites like Sandy Hill, Connecticut (Jones and Forrest 2003). The archaeological manifestation of productivity may be seen in the concentration (frequency) rather than size of individual sites (such as Edgar or Andridge) or even findspots of Nettling points around former wetlands. A more detailed and accurate reconstruction of biological communities during the early Holocene requires plant and animal macrofossil data and a consideration of soil classes (e.g., Frink and Hathaway 2003; MacDonald 2002).

Edgar Site

The site was first encountered by ASI in December of 1997 during a Stage 2 assessment of a subdivision, at which time only two lithic artifacts were recovered, a primary thinning flake and a core fragment. The location of these finds overlapped with a Euro-Canadian occupation, and it was during subsequent investigations of that site, conducted in July of 2003, that 57 additional lithic artifacts were discovered on the surface of the site, covering an area of approximately 400 m^2. Included in this material were an Early Archaic Nettling projectile point and a biface. Nettling points date to circa 9,700–8,900 RCYBP (Ellis et al. 1990, 1991).

Block excavation within the main surface concentration was subsequently undertaken. One-metre square units were placed on all sides of units containing 10 or more artifacts, and this pattern was expanded outwards until yields diminished below 10 artifacts per square metre, indicating that the site margins had been reached. All units were excavated to sterile subsoil and soil contents were screened through 6.4 mm steel mesh to aid in the recovery of artifacts. A total of 230 one-metre square units was excavated during the investigations (Figure 3), revealing a ploughzone concentration of lithic artifacts measuring approximately 30 × 16 m.

The topsoil–subsoil interface was trowelled to expose any subsurface concentrations of artifacts possibly designating feature remnants. The only pieces encountered by trowelling were located on high points between ploughscars, suggesting that any clusters that had existed had been dispersed by ploughing. There were no

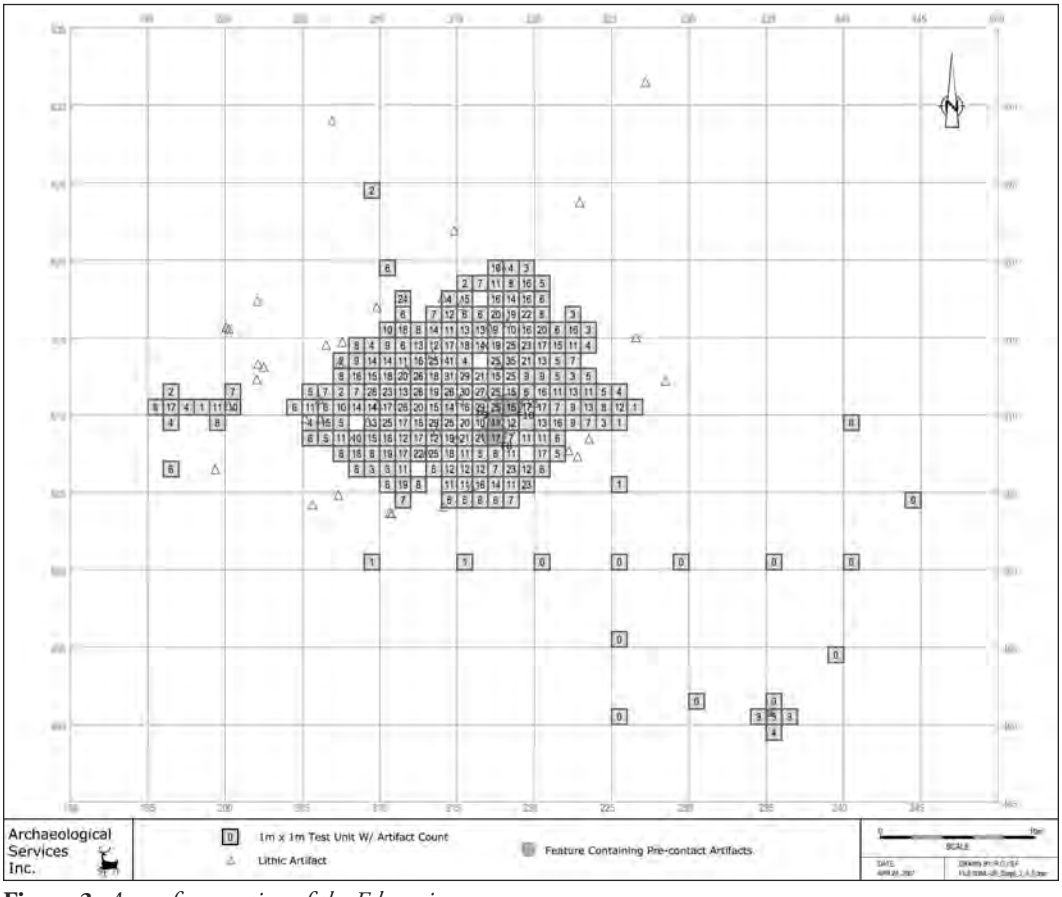

Figure 3. *Area of excavation of the Edgar site.*

indications otherwise of features dating to the Early Archaic occupation of the site.

Three small pit features (Features 8, 9, and 10) dating to the overlapping Euro-Canadian historic occupation were encountered (Figure 3), and although they were filled primarily with historic materials, 48 lithic artifacts were also recovered from Features 8 and 10.

Artifact Analysis

The assemblage consists of 2,974 lithic pieces, including 226 primary thinning flakes (7.6%), 1,092 secondary knapping flakes (36.7%), 259 secondary retouch flakes (8.7%), and 1,345 pieces of shatter (45.2%). Also present were three core trimming flakes and four core fragments, including one bipolar core. Included in the above totals are 40 unifacially worked flakes or "expedient" tools exhibiting at least one area of retouch along a working edge. These tools were made on 14 primary thinning flakes, 14 pieces of shatter, and 12 secondary knapping flakes.

The remainder of the assemblage consists of 45 tools, including 10 projectile points or projectile point fragments, 1 complete biface and 25 biface fragments, 2 drills, 3 gravers, 4 scrapers including an end scraper, and 1 spokeshave (Table 2).

Most lithic artifacts (2,927, or 98.4%) were manufactured from Onondaga chert, with the remaining pieces comprising 34 from Lockport (Ancaster) chert, 6 from Bois Blanc chert, 3 from Balsam Lake chert, 2 from Trent Valley chert, and 2 from quartzite (Table 2).

Thermal alteration, predominantly in the form of "pot lidding," sometimes with accompanying distinctive texture changes, is visible on 149 artifacts (5%; Table 2).

Projectile Points. Two complete projectile points and eight fragments were recovered from the site (Table 3; Figure 4). One complete point (catalogue number L842) resembles an Early Archaic Bifurcate Base point, dating to 8,900–8,000 RCYBP (Ellis et al. 1990, 1991). It has a slightly notched base and is stemmed or side-notched rather than corner-notched (Figure 4e). It is possible that the notch is a use break from impact where the base was pushed against the shaft—if this was the case, it could also be a use-damaged side-to-corner-notched serrated point similar to the other specimens from the site. The

Table 2. *Flaked Lithic Assemblage at Edgar.*

	Total		Thermally Altered		Retouched/ Utilized		Onondaga Chert		Lockport Chert	
Artifact type	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Primary thinning flakes	226	7.60	3	2.01	14	34.15	220	7.52	5	14.71
Secondary knapping flakes	1092	36.72	24	16.11	12	29.27	1085	37.07	7	20.59
Secondary retouch flakes	259	8.71	8	5.37	-	-	256	8.75	3	8.82
Shatter	1345	45.23	111	74.50	14	34.15	1319	45.06	14	41.18
Core trimming flakes	3	0.10	-	0.00	-	-	3	0.10	-	-
Bipolar cores/flakes	1	0.03	1	0.67	-	-	-	-	1	2.94
Cores	3	0.10	-	-	-	-	2	0.07	1	2.94
Bifaces/fragments	26	0.87	2	1.34	-	-	26	0.89	2	5.88
Drills/fragments	2	0.07	-	-	-	-	1	0.03	-	-
Gravers	3	0.10	-	-	-	-	3	0.10	-	-
Scrapers	4	0.13	-	-	-	-	3	0.10	-	-
Projectile points/fragments	10	0.34	-	-	-	-	9	0.31	1	2.94
Total	**2974**	**100.00**	**149**	**100.00**	**40**	**100.00**	**2927**	**100.00**	**34**	**100.00**

Table 3. *Projectile Points/Fragments from Edgar.*

		Dimensions (mm)			
Cat. #	**Material**	**Length**	**Width**	**Thickness**	**Comments**
L842	Onondaga	22	18	5	Bifurcate base pt., side-notched, broken tip; base w = 13, notch w = 5, d = 3mm
L843	Lockport	31	23	6	Complete, serration on 1 side only—perhaps pt. was unfinished; base w = 15; notch w = 4, d = 4mm
L22	Onondaga	28	23	5	Broken base, stem W = 12mm; damaged tip and flake removal resulting from impact fracture
L347	Onondaga	16	15	5	Base + partial shoulder of small notched pt. with slightly serrated edge, convex base; base W = 12, H = 8mm
L366	Onondaga	11	14	4	Tip frags., slight serration evident
L377	Onondaga	8	12	4	Small tip fragment
L398	Onondaga	7	16	4	Base of stemmed or notched projectile point or possible expanding base of drill
L838	Onondaga	20	22	5	Serrated corner-notched pt. made on a flake, re-touched base; broken at midsection; base w = 14; notch w = 4; d = 4mm
L839	Onondaga	27	17	5	Finely serrated corner-notched pt., missing tip; base w = 13, notch w = 3, d = 3mm
L844	Onondaga	30	21	5	Pronounced serration on both sides, broken base and tip; stem w = 11mm

other complete specimen is an Early Archaic Nettling-like point manufactured from Lockport (Ancaster) chert (L843). It may represent an unfinished point, as only one side shows pronounced serration and an elongated tang (Figure 4f).

There are five other serrated corner-notched point fragments, two of which are fragments missing their tips only (Figure 4c, d). Two others have broken tips and bases (Figure 4a, g), and there is one base and partially serrated blade fragment (L347; Figure 4b). Otherwise, these specimens appear to be finished points in that they are well thinned, notched, and serrated, with well-defined shoulders. This evidence suggests that the damage to these points occurred because of use rather than manufacture. One specimen (L844; Figure 4g) exhibits very pronounced, regular serration along both sides.

The remainder consists of two projectile point tip fragments as well as another base fragment that may not belong to a projectile point but rather to an expanding base of a drill.

Bifaces. One complete and 25 biface fragments were recovered (Table 4; Figures 5 and 6). Most bifaces are small, averaging 26 mm long, 20 mm wide, and 7 mm wide. They are all well made, exhibiting thin, bi-convex transverse sections. In general, the bifaces are well flaked, with straight, non-sinuous edges, indicative of a more advanced, later stage of biface production. The flaking also

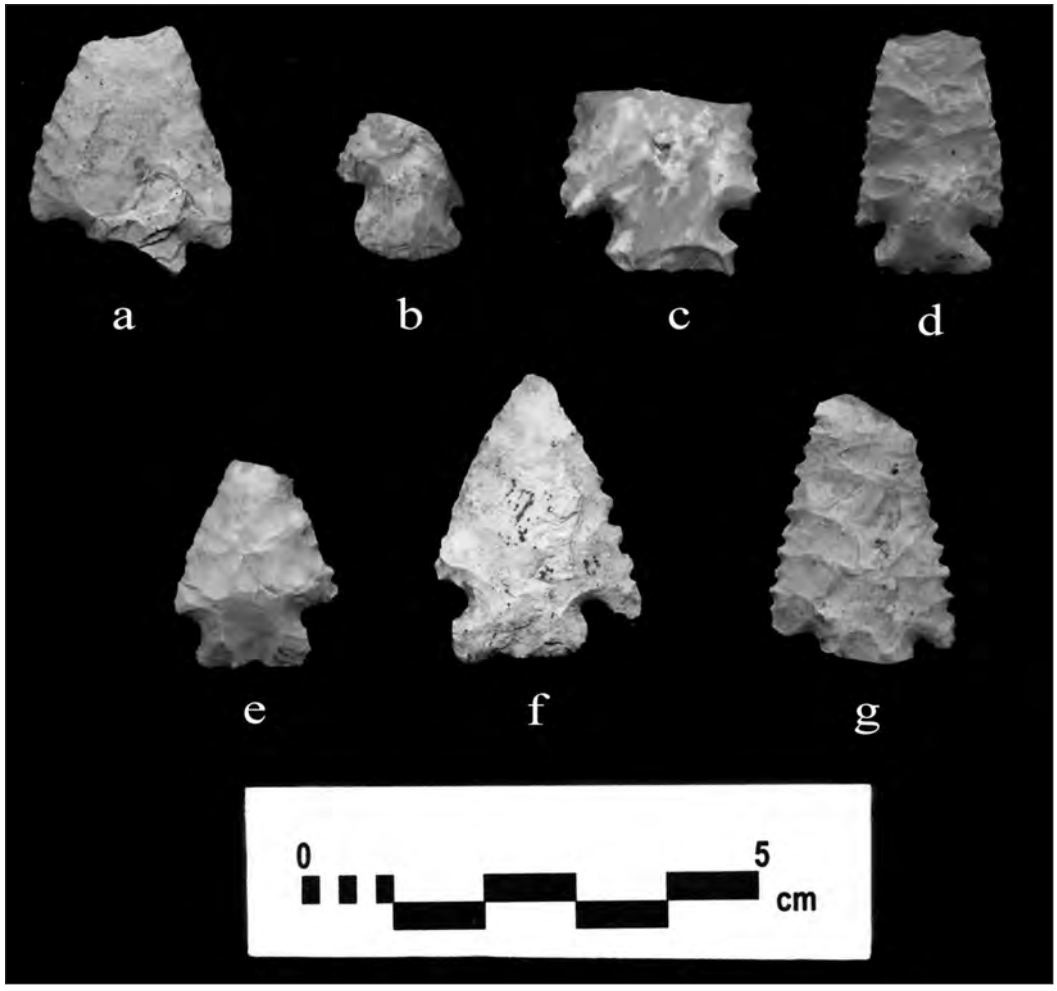

Figure 4. *Selected projectile points from Edgar. (a) L22, (b) L347, (c) L838, (d) L839, (e) L842, (f) L843, and (g) L844.*

seems to have been initiated from all directions (e.g., L371), suggesting that some were used as bifacial cores. The one complete biface (L449) has lateral edge retouch but is crude in workmanship, with sinuous edges and incomplete bifacial flaking (Figure 5d).

Many of the biface fragments seem to have been broken by snap fracturing through the middle. There are 10 tip fragments, 6 of which exhibit thinning, indicating their potential function as preforms that had been shaped and thinned but then broken before they could be refined further (L216, L217, L205, L117, L462, L675; Figure 6 a–d, i, j). They are advanced-stage bifaces or performs that are evenly flaked, bi-convex in cross-section, and serrated in some cases (L217). One biface tip (L462) is quite wide, providing lots of scope for further shaping.

There were six biface base fragments, of which three were square bases, which appear to have been well-thinned and -shaped, with regular cross sections, before snapping at the midsection (L244, L248, L846; Figure 6e, f, l). They may represent the bases of point performs that were going to be notched but prematurely broke. One base (L846) also has serrated lateral edges. One other specimen (L702) is a medial flake fragment exhibiting some lateral denticulation or serration.

Table 4. *Bifaces from Edgar.*

					Dimensions (mm)			
Cat. #	**Material**	**Thermal Alteration**	**Thermally Altered (n)**	**Retouched/ Utilized**	**Length**	**Width**	**Thickness**	
L449	Onondaga	-	-	-	54	41	13	
L9	Lockport	-	-	-	43	37	11	
L96	Onondaga	-	-	-	51	43	12	
L117	Onondaga	-	-	Yes	27	21	5	
L205	Onondaga	-	-		27	17	5	
L216	Onondaga	Yes	1	Yes	23	22	6	
L217	Onondaga	-	-	-	21	20	6	
L244	Onondaga	-	-	Yes	21	20	4	
L248	Onondaga	-	-	-	19	24	5	
L252	Onondaga	-	-	-	27	40	9	
L253	Onondaga	-	-	-	23	20	9	
L346	Onondaga	-	-	-	29	17	7	
L371	Onondaga	-	-	-	33	27	7	
L448	Onondaga	Yes	1		23	11	5	
L462	Onondaga	-	-	-	27	30	5	
L493	Onondaga	-	-	-	25	12	4	
L523	Onondaga	-	-	-	15	9	5	
L537	Onondaga	-	-	-	14	14	6	
L554	Onondaga	-	-	-	15	6	4	
L637	Onondaga	-	-	-	21	29	9	
L643	Lockport	-	-	-	25	14	9	
L658	Onondaga	-	-	-	24	14	6	
L663	Onondaga	-	-	-	42	24	13	
L675	Onondaga	-	-	-	14	20	4	
L696	Onondaga	-	-	-	27	18	7	
L846	Onondaga	-	-	-	35	27	6	

	Comments
	Lateral edge retouch; crude biface, sinuous edges, incomplete flaking
	Preliminary stage, incomplete bifacial flaking
	Missing tip and one lateral portion; middle stage biface, sinuous edges, incomplete bifacial flaking
	Biface or projectile point tip
	Preform, tip + midsection frag., thin
	Preform or possible projectile point tip, thin, slight serration on one edge
	Tip fragments of preform, thin
	Preform with square base, thinned, regular bi-convex cross-section
	Base portion of thin, refined biface
	Tip portion of middle stage biface, sinuous edges, incomplete bifacial flaking
	Tip portion of crude biface
	Prob. tip fragment of middle stage biface
	Poss. bifacial core, multi-directional flaking, retouched and/or battered lateral margin,
	Edge fragment
	Preform tip fragment, thin with smooth, evenly flaked surfaces, bi-convex cross-section
	Biface edge fragment, made on a flake
	Probable biface edge fragment
	Biface tip fragment
	Small biface fragment
	Base fragment, incomplete bifacial flaking
	Midsection fragment
	Probable base fragment of middle stage biface
	Crude biface or bifacial core frag.
	Tip fragment, lateral edge is retouched
	Tip or base fragment of middle stage biface
	Preform fragment with square, thinned base, broken halfway up

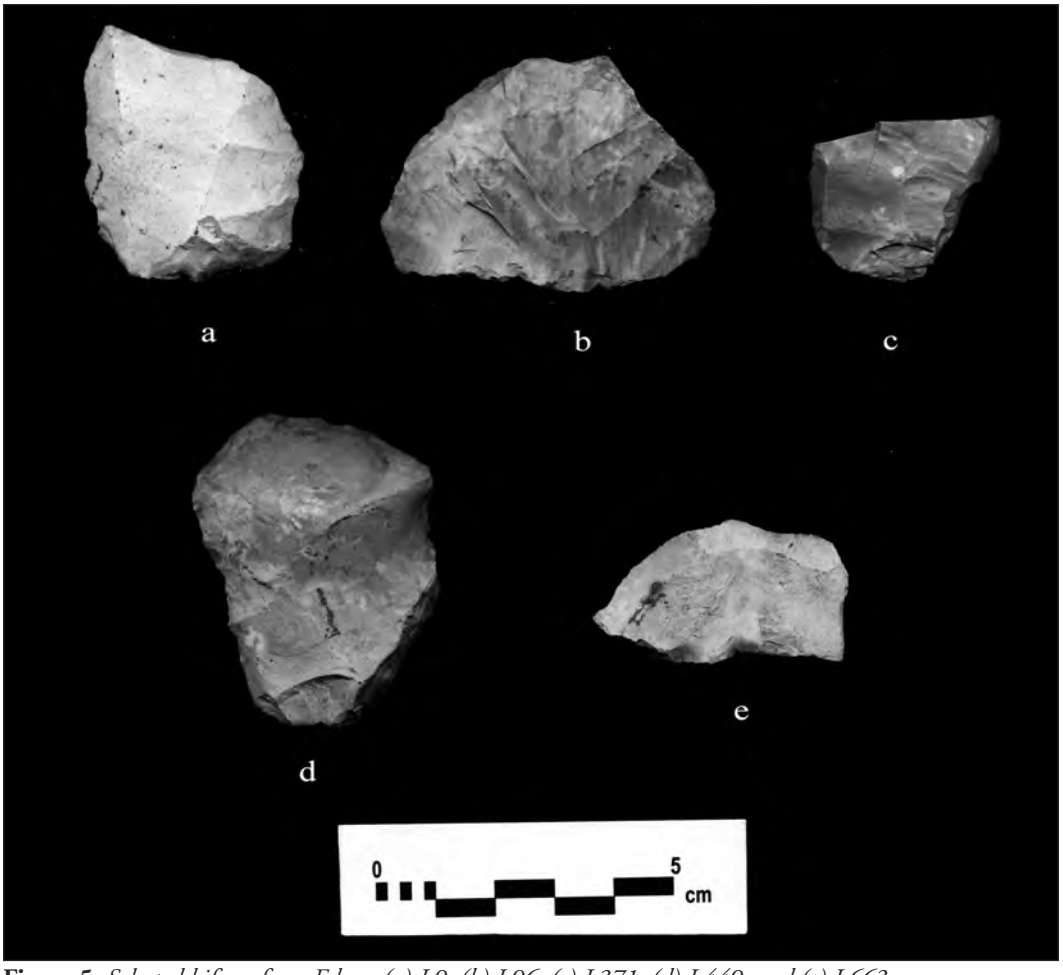

Figure 5. *Selected bifaces from Edgar. (a) L9, (b) L96, (c) L371, (d) L449, and (e) L663*

Bifaces displaying cruder workmanship are also present, including one manufactured of Lockport (Ancaster) chert. These bifaces are larger and thicker in size, with incomplete flaking on both sides and more sinuous, rather than straight edges (L9, L96, L371, L663; Figure 5a–c, e).

The remaining five fragments are small biface edge or miscellaneous fragments.

Drills. One drill has an expanding base and a narrow fore-section broken near the tip (L840; Figure 7g). Another specimen (L398; Table 3) may represent the base of a stemmed or notched projectile point or another example of an expanding base of a drill. Expanding base drills have been documented as the most common of the four drill base types noted at the Nettling site (Ellis et al. 1991:9). There is also a midsection fragment of a probable drill (L393; Table 5).

Gravers. One of the gravers in the collection is a fragment with a damaged tip, possibly from use (L816; Figure 7f). Another is a bifacial tool fragment with a graver projection (L841; Figure 8e). The third specimen (L414) has a worked tip resembling a graver, but it may also qualify as a "beaked scraper" (e.g., Storck 1997; Figure 7d). This specimen also appears to have been made on a reworked biface fragment (Table 6).

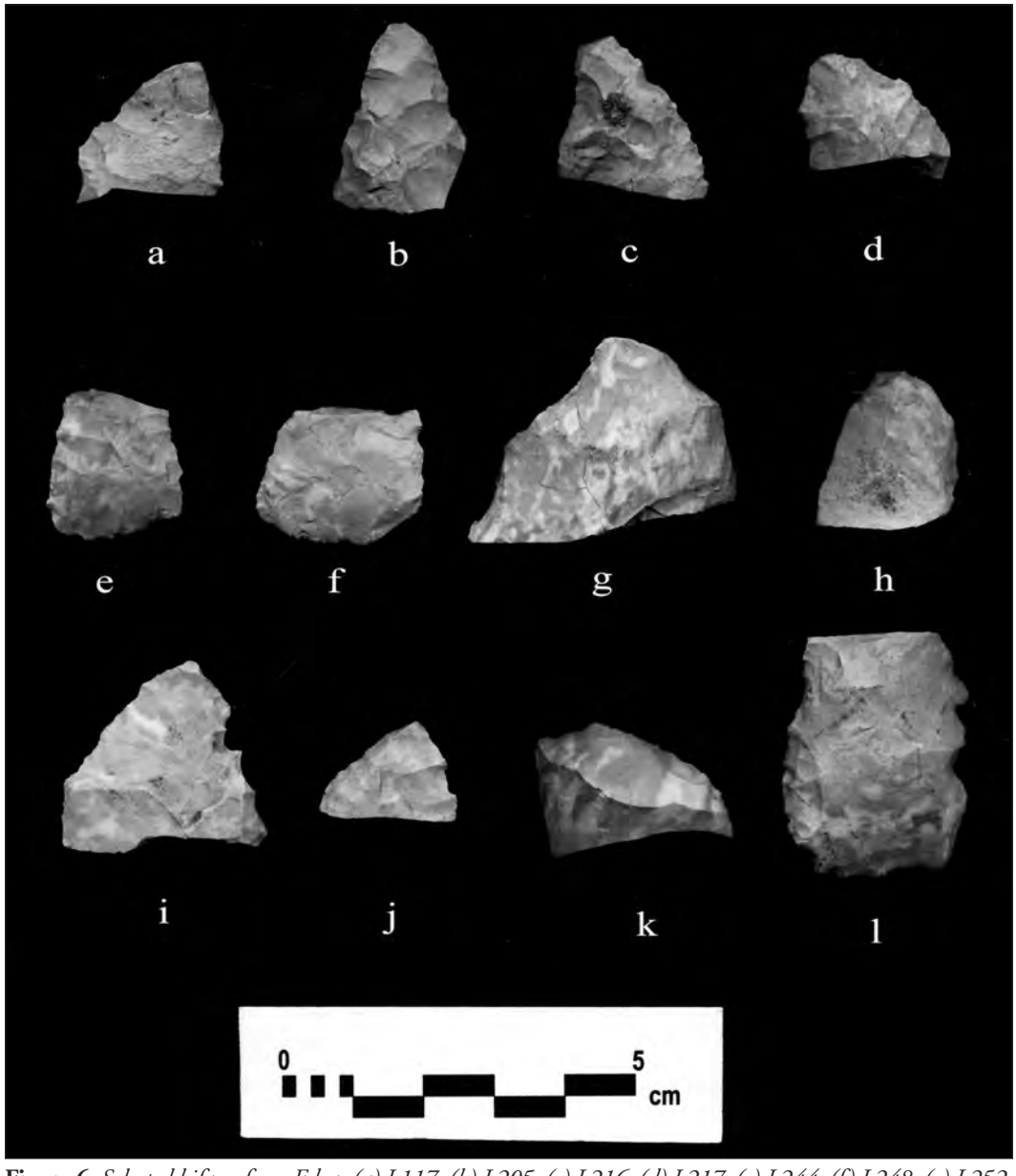

Figure 6. *Selected bifaces from Edgar.(a) L117, (b) L205, (c) L216, (d) L217, (e) L244, (f) L248, (g) L252, (h) L253, (i) L462, (j) L675, (k) L696, and (l) L846*

Scrapers. The distal portion of an end scraper was found (L845; Figure 7b). It is too fragmentary to identify whether it conforms to the "tear-drop" shape, intended for hafting, that Ellis and others describe among the Nettling site end scrapers (Ellis et al. 1991:11). Another biface edge fragment exhibits steep, continuous retouch for use as a scraper (L399; Figure 7a). There is also a spokeshave (L519; Figure 7c) made on the distal edge of a flake, as well as another scraper with a concave scraping surface resembling a spokeshave (L473; Table 7).

Table 5. *Drills from Edgar.*

			Dimensions (mm)			
Cat.	**Material**	**Retouched/ Utilized**	**Length**	**Width**	**Thickness**	**Comments**
L393	Onondaga		8	11	3	midsection fragment of probable drill
L840	Onondaga		20	29	6	expanding base drill, missing tip

Table 6. *Gravers from Edgar.*

			Dimensions (mm)			
Cat.	**Material**	**Retouched/ Utilized**	**Length**	**Width**	**Thickness**	**Comments**
L841	Onondaga	Yes	38	26	5	worked graver tip on a flake
L414	Onondaga	Yes	36	13	10	"beaked" scraper– bifacial tool with worked graver tip
L816	Onondaga	Yes	19	11	5	retouched laterally with poss. use-damaged tip

Table 7. *Scrapers from Edgar.*

			Dimensions (mm)			
Cat.	**Material**	**Retouched/ Utilized**	**Length**	**Width**	**Thickness**	**Comments**
L845	Onondaga	Yes	25	16	6	end scraper with pronounced retouch on distal edge of flake fragment
L399	Onondaga	Yes	35	14	7	pronounced scraping surface on a biface edge frag., w/ polish
L473	Onondaga	Yes	18	8	3	poss. spokeshave, concave retouched scraping surface, broken in use
L519	Onondaga	Yes	25	22	5	spokeshave, concave retouched scraping edge

Artifact Distribution

The distribution of artifacts across the excavated one-metre squares was "smoothed" to resolve any areas of higher artifact concentration. The results indicate an approximately 7 × 10 m area of dense concentration, from grid lines 209 to 219 east–west and 507 to 514 north–south (Figure 8). Artifact yields in this area exceeded 14 pieces per square metre to a maximum of 41 artifacts in unit 513–214 (Figure 9). There are two one-metre-square-sized hotspots within the concentration in the north central portion of the zone. There are also two small, discrete pockets of unit yields exceeding 20 artifacts to the north and one to the south of the main concentration (units 517–211, 516–219, 506–218/505–219; Figure 8). The dimensions of the central artifact concentration fit within size range estimates reported for structures documented in Late Archaic components, such as the Innes (Lennox 1986) and Canada Century sites (Lennox 1993:19). Lennox cites cold-weather occupations as requiring more indoor space for

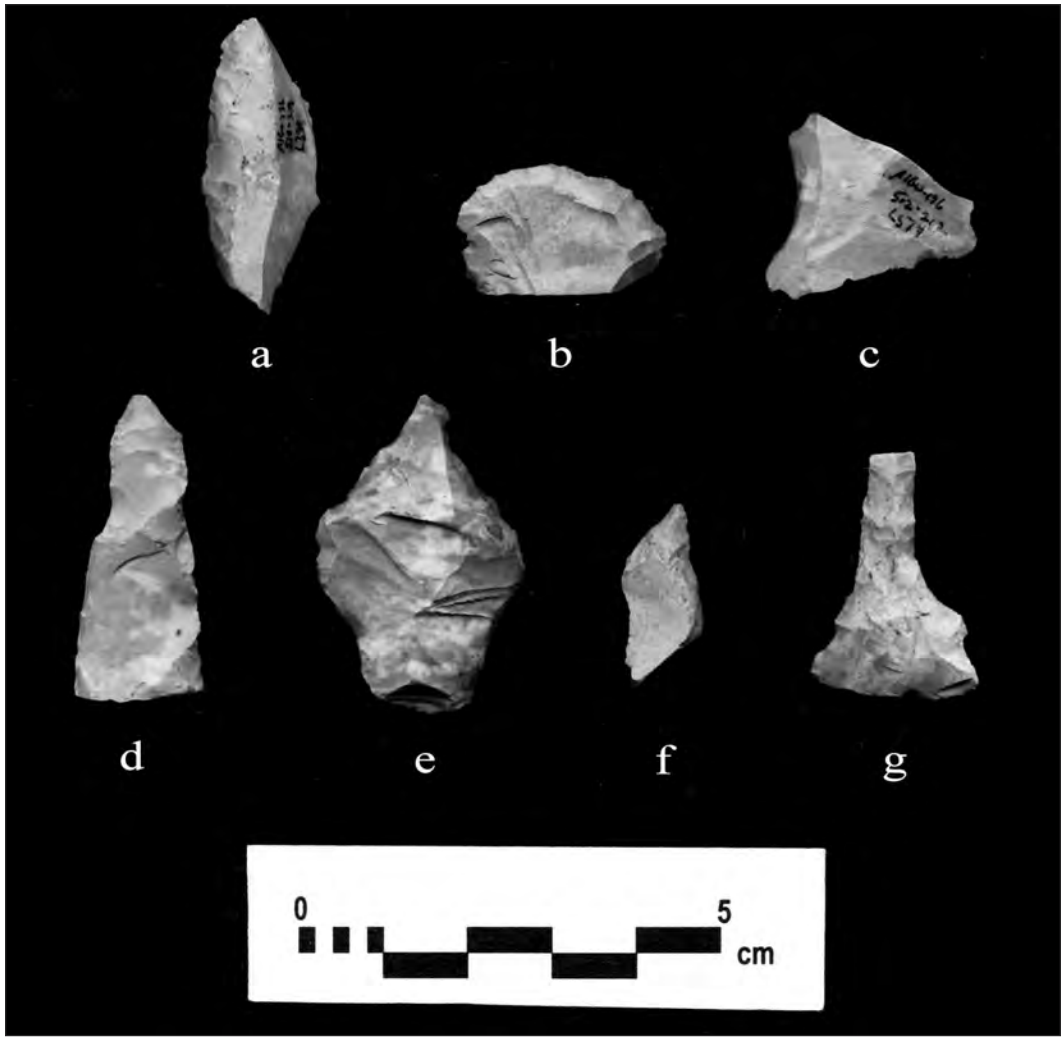

Figure 7. *Selected tools from Edgar. (a) L399, (b) L845, (c) L519, (d) L414, (e) L841, (f) L816, and (g) L840.*

activities and hence larger house structures (Lennox 1993). However, the artifact density distribution at Edgar does not conform to a pattern of "primary" and "secondary" peaks as noted by Lennox at the Innes site to indicate the presence of central activity areas bounded by house walls against which debris would accumulate (Lennox 1986:236–237).

At the Little Shaver site, Timmins proposed a Middle Archaic house structure based on two zones of artifact distribution within the house: an inner drop zone around a hearth and, an outer "displacement zone" with a sharply defined outer edge, representing accumulation of secondary refuse against the house wall through sweeping, etc. This house structure measured 6 × 5 m (Timmins 1996:76), much smaller than the Innes or Canada Century site houses and the artifact concentration at Edgar. Contrary to Lennox, Timmins argues that typical hunter-gatherer houses, including cold-weather structures, were typically of a smaller size, as documented ethnographically by the 5 × 8 m winter cabins used by the Central Algonquians (Timmins 1996:76).

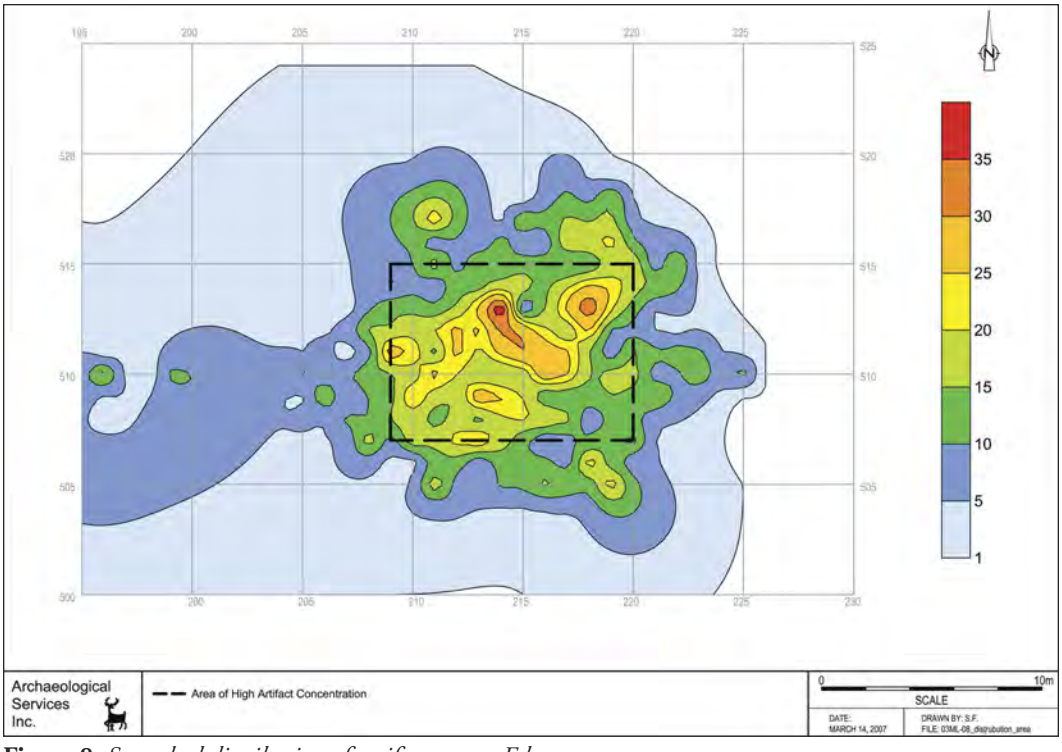

Figure 8. *Smoothed distribution of artifacts across Edgar.*

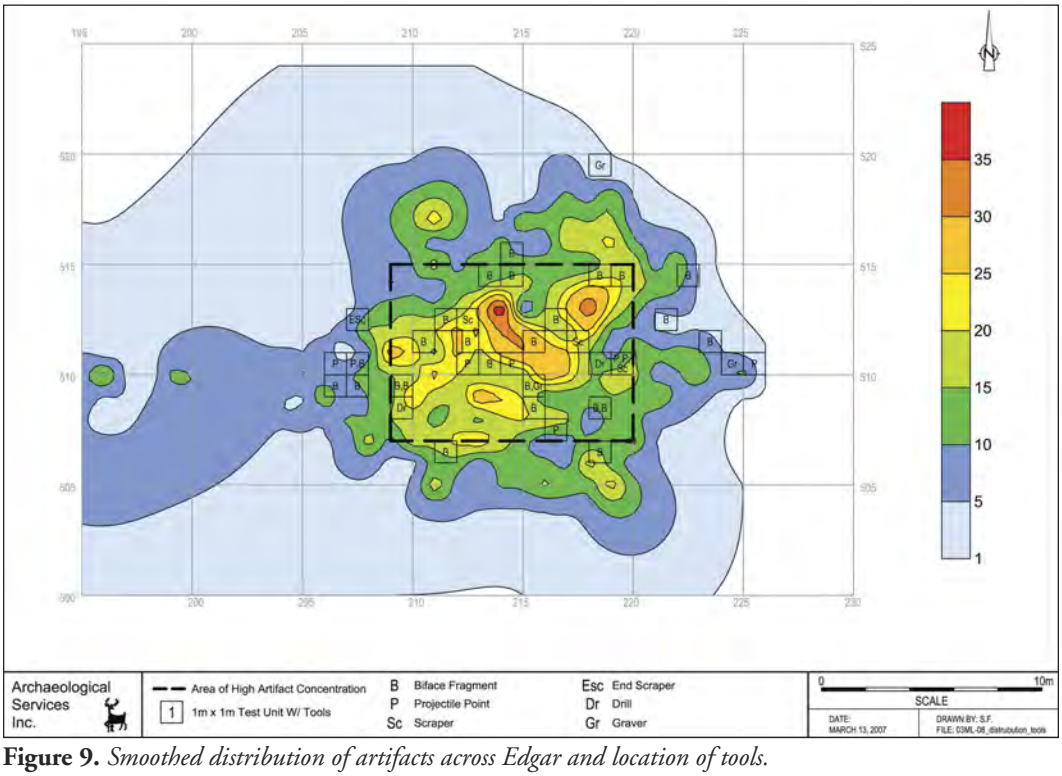

Figure 9. *Smoothed distribution of artifacts across Edgar and location of tools.*

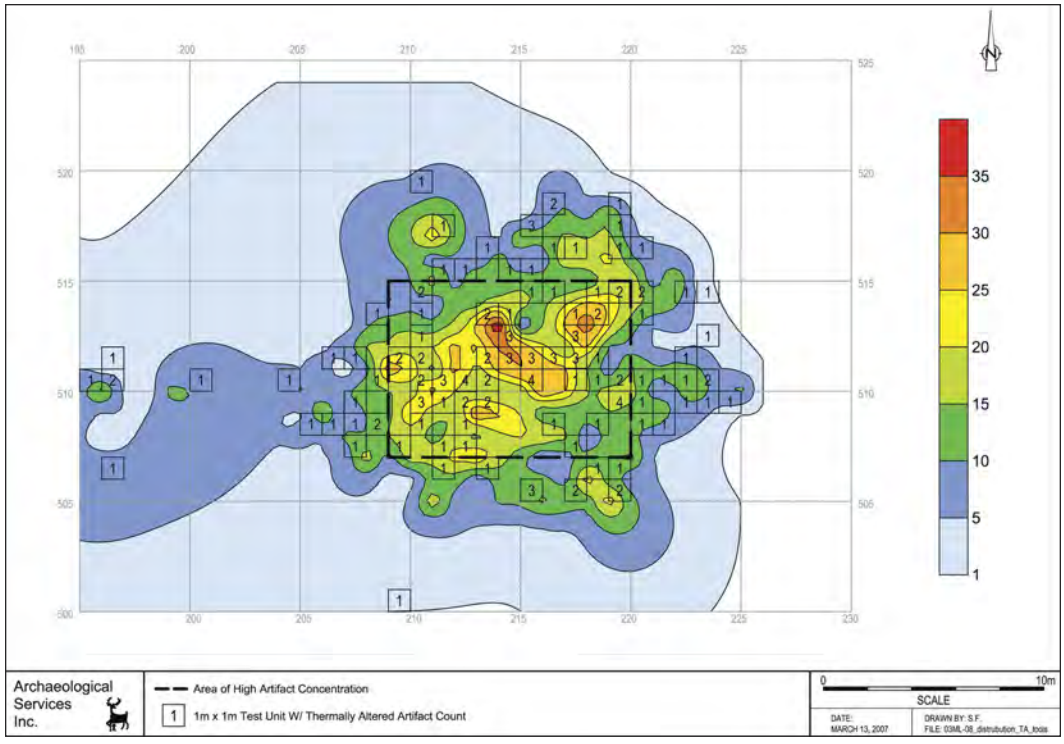

Figure 10. *Smoothed distribution of artifacts across Edgar and location of thermally altered items.*

The centralized activity area at Edgar is more likely to represent an exterior activity locus with smaller, outlying task-specific loci also present. Alternatively, these loci may represent "toss zones" for generally larger debris, as documented by Timmins in the artifact distribution surrounding exterior hearths dating to the Early Woodland component at the Little Shaver site (Timmins 1996:64).

The distribution of formal tools recovered during excavation was even across the site area, arguing against specific activities being conducted at certain locations. The area of high concentration contained 53 percent (23) of the tools excavated at the site (Figure 9). A total of 79 artifacts displaying evidence of thermal alteration were present in the high concentration area of the site (Figure 10). This fact plus the notion of an exterior activity area supports a hypothesis of a warm-weather occupation.

Andridge Site

The Andridge site (AlGu-347) was first encountered in 2005 during a Stage 1 and 2 archaeological assessment in a former pine plantation operated by the Ministry of Natural Resources. A test pit survey resulted in the recovery of three pieces of Onondaga chert shatter from a shovel test pit. As additional test pitting did not result in the recovery of more artifacts, the original test pit was expanded into a one-metre square unit (500–200) yielding nine additional pieces of shatter. Two units placed directly north and south of the first (501–200, 499–200) yielded 15 pieces of debitage each. During Stage 3 investigations, 13 additional ploughzone test units were hand excavated resulting in the recovery of 80 additional pieces of debitage and two crude bifaces in two discrete artifact concentrations about 10 m apart (Figure 11).

The Stage 4 assessment entailed the

excavation of an additional 76 one-metre units located within each of the areas of highest artifact density: 44 in the north locus and 32 in the south (Figure 11). The excavations were terminated when ploughzone artifact yields dropped to below 10 items per square metre. The 44 m² in the

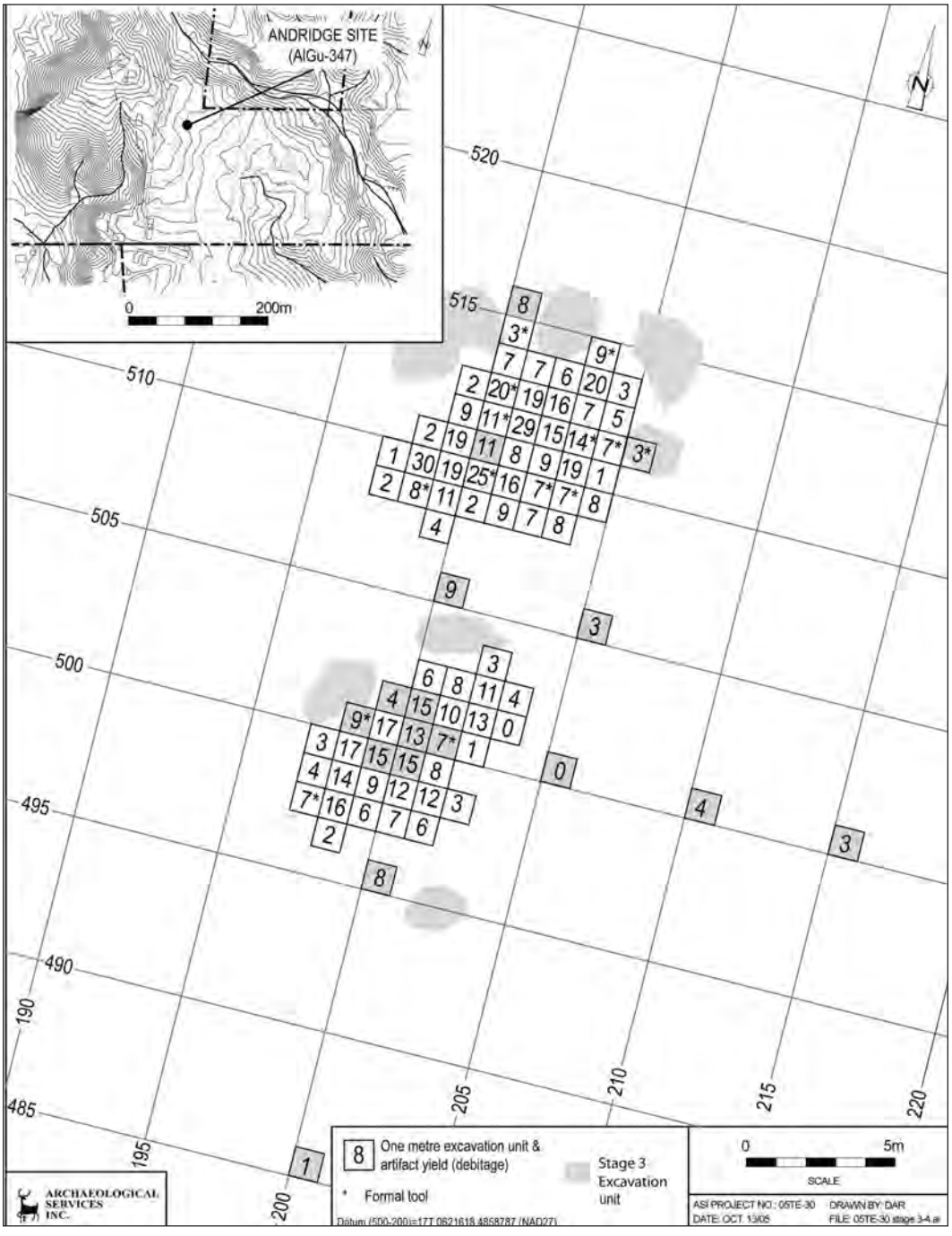

Figure 11. *Stages 3 and 4 lithic artifact counts at Andridge. Irregular shaded areas are disturbances.*

northern locus yielded 453 artifacts, including five fragmentary bifaces and seven end scrapers, while the south locus yielded 277 artifacts, including three bifaces. The vast majority of the debitage is shatter. Combined, the Stages 3 and 4 assessments resulted in the recovery of 758 lithic artifacts from 83 m^2 units excavated across a 200 m^2 area.

Artifact Analysis

Artifact types recovered from the Stages 3 and 4 investigations are listed in Table 8. Within the overall assemblage, the chert types represented include Onondaga (n = 753), Lockport (Ancaster) (n = 4), and Trent Valley (n = 1). Thirty-one lithic artifacts, or 4.1 percent of the assemblage, exhibit evidence of thermal alteration. Retouch and/or utilization are present on two artifacts, or 0.3 percent of the assemblage.

Table 8. *Stages 1–4 Lithic Artifact Frequencies and Percentages from Andridge.*

Artifact Type	n	%
Core fragment	1	0.1
Core trimming flake	1	0.1
Primary reduction flake	4	0.5
Primary thinning flake	19	2.5
Secondary knapping flake	180	23.8
Secondary retouch flake	49	6.5
Shatter/flake fragment	489	64.5
Formal end scraper	7	0.9
Biface/biface fragment	8	1.1
Total	**758**	**100.0**

Bifaces. All eight biface and biface fragments are manufactured from Onondaga chert (Table 9). Two complete, crude bifaces were recovered (L30; Figure 12a) and (L12; Figure 12b).

Six biface fragments were recovered and include a lateral edge fragment of a semi-refined biface (L14; Figure 12c) and a base of a biface (L97; Figure 12d). A crude biface fragment (L127; Figure 12e), a small biface edge fragment (L169; Figure12f), and another fragment (L174; Figure 12g) were also recovered.

A midsection/basal portion of a refined biface (L209; Figure 12h) has full facial oblique dorsal flaking and irregular ventral flaking. It also exhibits narrowing toward the base. It was recovered in the northeastern most perimeter of the site.

The complete bifaces and one biface fragment (L30, L12, L14) were recovered from the southern concentration of artifacts, while the remaining five biface fragments were recovered from the northern artifact concentration of the site.

Table 9. *Bifaces from Andridge.*

			Dimensions (mm)			
Cat.	**Material**	**Thermally Altered (n)**	**Length**	**Width**	**Thickness**	**Comments**
L12	Onondaga	-	46	30	14.1	crude, early stage biface
L127	Onondaga	-		21.2	8	crude, edge fragment
L14	Onondaga	-	39.2	19.9	11.1	lateral edge fragment of early stage biface
L169	Onondaga	-			7	small edge fragment
L174	Onondaga	-	38.3	23.5	6.9	biface fragment
L209	Onondaga	-		32.6	5.5	midsection/base of refined preform, oblique dorsal flaking and blade narrowing
L30	Onondaga	-	33.5	36.9	12	crude, early stage biface
L97	Onondaga	1	34.2	30.3	6.8	base of thin, semi-refined biface

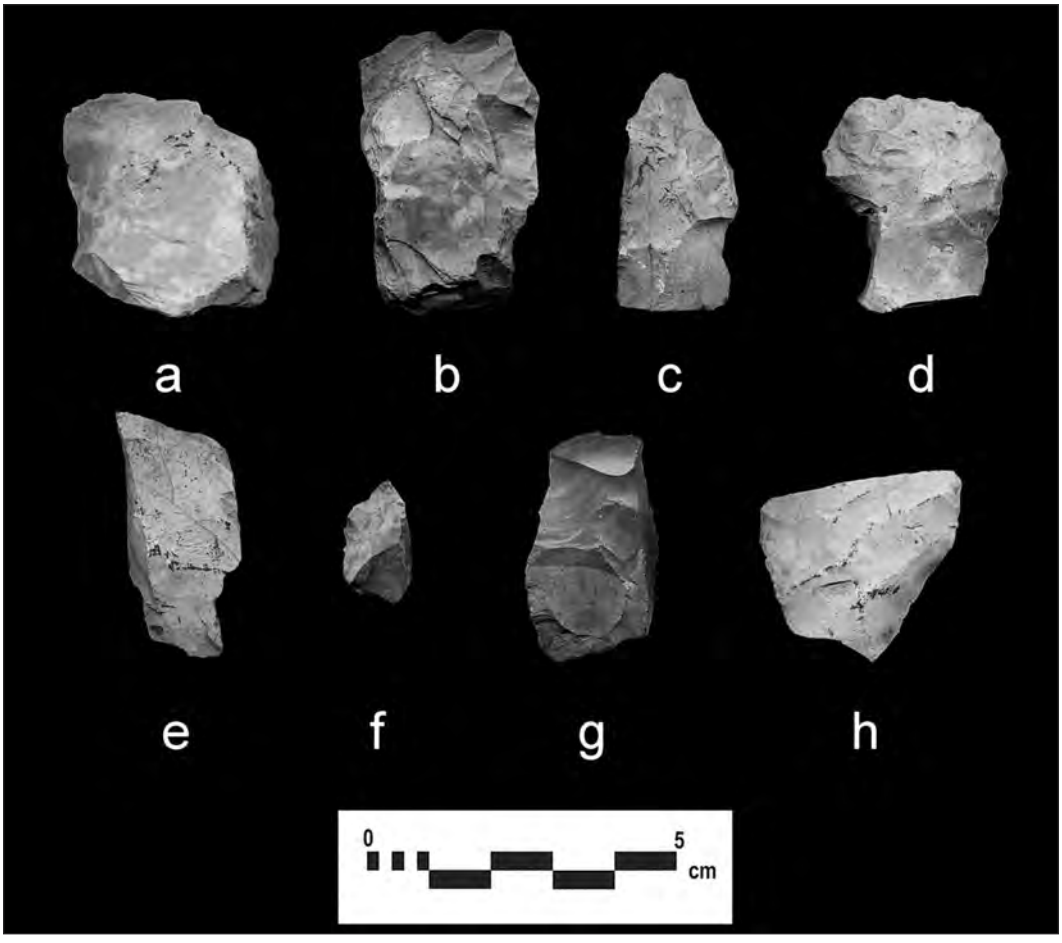

Figure 12. *Selected chert bifaces and biface fragments from Andridge: (a) complete (L30), (b) complete (L12), (c) lateral edge fragment of a semi-refined biface (L14), (d) base (L97), (e) fragment (L127), (f) fragment (L169), (g) fragment (L174), and (h) midsection/base of a refined biface (L209).*

Scrapers. All seven end scrapers were manufactured from Onondaga chert; one shows evidence of thermal alteration (Table 10). All are unifacial and are made on primary thinning flakes that have pronounced retouch on their distal margins creating end scraping surfaces. Most specimens also have slightly tapered lateral edges and three exhibit retouch on one or both lateral margins, perhaps functioning as end/side scrapers (L180, L183, L207). L0180 (Figure13f) has retouch present along both lateral margins. L183 (Figure 13g) has an elongated form and pronounced retouch along all margins. L207 (Figure 13b) exhibits retouch extending along one lateral margin. Two specimens appear to be solely end scrapers: L218 (Figure 13a) and L175 (which is thermally altered; Figure13e).

Three specimens have spurs (L131, L160, L183; Figure 13c, d, e, respectively). L131 exhibits a single corner spur and slightly expanding sides as well as the presence of moderate dorsal flaking. A single corner spur was also present on L160 and L183, a combination end/side scraper described above, displays multiple spurs on its lateral margins along with full dorsal flaking.

The scrapers are uniform in size, averaging 32

Table 10. *End Scrapers from Andridge.*

			Dimensions (mm)			
Cat.	**Material**	**Thermally Altered (n)**	**Length**	**Width**	**Thickness**	**Comments**
L131	Onondaga	-	32.6	22.1	8.7	spurred end scraper, slightly expanding lateral edges, dorsal flaking
L160	Onondaga	-	31	21.9	6.5	spurred end scraper on primary thinning flake
L175	Onondaga	1	28.4	21	6	end scraper on a primary thinning flake fragment
L180	Onondaga	-	32.8	24.3	7	end/side scraper; distal retouch extends along one lateral margin
L183	Onondaga	-	39.1	23.5	7	elongate, multiple spurred end/side scraper w full dorsal flaking; corner and lateral spurs
L207	Onondaga	-	37.8	21.3	6.6	end/side scraper; primary thinning flake w distal and lateral retouch
L218	Onondaga	-	25	23	7	end scraper on a primary thinning flake

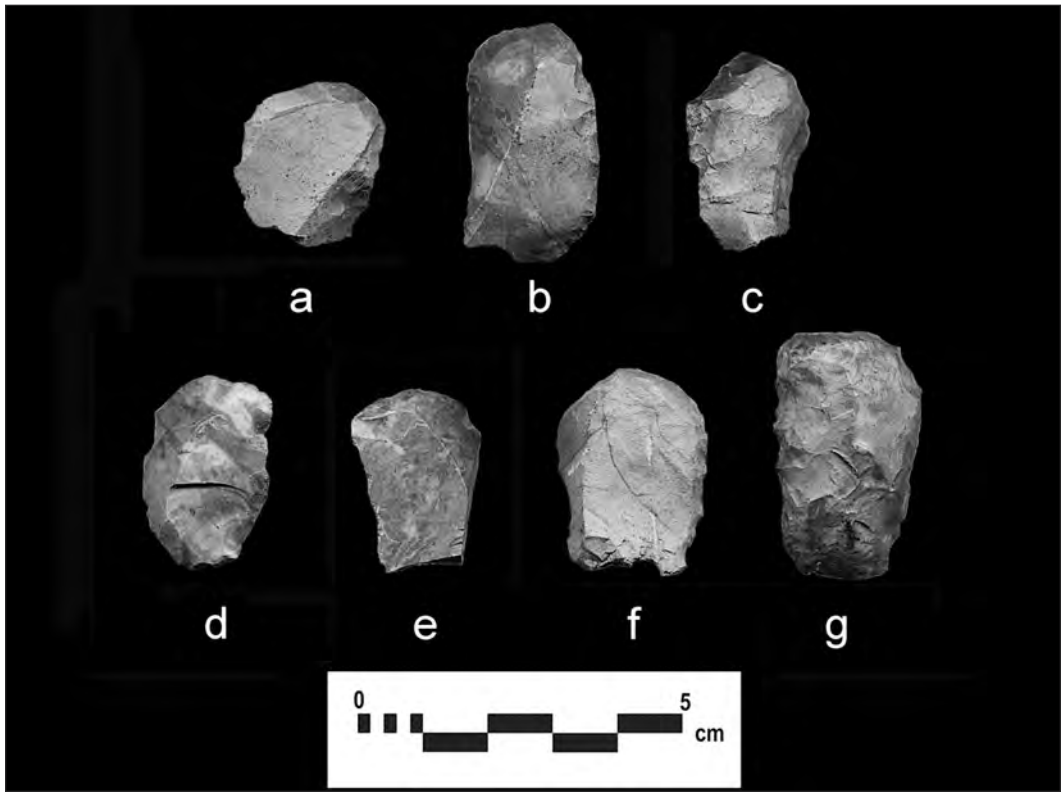

Figure 13. *Selected chert scrapers from Andridge: (a) end scraper (L218), (b) end scraper (L207), (c) end scraper (L131), (d) end scraper (L160), (e) end scraper (L175), (f) end scraper (L180), and (g) end scraper (L183).*

mm in length, 22mm in width and 7 mm in thickness, which is within the size ranges of end scrapers reported from other Early Archaic sites like Nettling (McMillan 2003). It is noteworthy that all seven end scrapers were recovered from the northern artifact concentration.

Artifact Distribution

Two artifact concentrations were documented that were approximately 4–5 m apart. The southern concentration covered an approximately 7 × 9 m area from grid lines 197 to 203 east–west and 495 to 503 north–south. The second, northmost concentration of artifacts covers a 9 × 9 m area from grid lines 197 to 205 east–west and 507 to 515 north–south.

The dimensions of both artifact concentrations (7 × 9 m and 9 × 9 m) fit within size range estimates reported for structures documented in Late Archaic components, such as the Innes (Lennox 1986) and Canada Century sites (Lennox 1993:19). As noted for the Edgar concentration, Lennox (1993) cites cold-weather occupations as requiring larger houses with more indoor space. However, like at the Edgar site, the artifact density distribution at Andridge does not conform to the pattern of "primary" and "secondary" peaks as noted by Lennox (1986:236–237).

The Middle Archaic house structure at the multi-component Little Shaver site, documented by Timmins (1996) and discussed above, had two zones of artifact distribution within the house: one around a hearth and the other an outer zone representing accumulation of secondary refuse against the house wall. That house structure measured 6 × 5 m, much smaller than the Innes or Canada Century site houses or the artifact concentrations at Andridge or Edgar.

It is possible, given the two restricted artifact concentrations at Andridge, that cultural material had been deposited within the confines of two small shelters/structures, similar to what has been suggested for the McKean site (Lennox 2002), or perhaps one structure (northern concentration) and one smaller activity area (southern concentration). If that is the case, one of the activities carried out in the northern concentration was the scraping of hides, in that all the scrapers were recovered from that area (Figure 14).

Alternatively, these loci may represent "toss zones" for generally larger debris, as documented by Timmins in the artifact distribution surrounding exterior hearths dating to the Early Woodland component at the Little Shaver site (Timmins 1996:64). A total of 32 artifacts displaying evidence of thermal alteration were present, 68 percent of them in the northern concentration of the site, suggesting the former presence of a hearth in that area (Figure 15).

Discussion and Comparison with Other Paleo and Early Archaic sites

The Edgar and Andridge sites date to the Early Archaic period, Edgar largely on account of the presence of Nettling-style projectile points, and Andridge because of the presence of unifacially flaked scrapers, some of which have one or more spurs as well as multiple lateral and end scraping surfaces. They are characterized by moderate to full dorsal flaking. Extensive dorsal flaking is characteristic of more than 50 percent of the end scraper assemblage at the Early Archaic Nettling site, probably as an aid for hafting, and serves to distinguish these items from earlier and later forms (Ellis et al. 1991:13; McMillan 2003).

The Edgar site encompasses an area of approximately 480 m^2 (30 × 16 m) and extends in an east–west orientation. Andridge is half the size, encompassing 200 m^2 (10 × 20 m) extending in a north–south orientation. A total of 230 units was excavated at Edgar, yielding an assemblage of 2974 artifacts, while at Andridge, a total of 758 artifacts was recovered from 83 units.

There are several ways of classifying the lithic assemblage data, for example, based on, widely recognized tool types (e.g., projectile points, end scrapers, gravers), inferred tool functions (e.g., weapons, piercing, scraping, cutting, incising), and knapping technique (e.g., bifacial, unifacial) and end-product (tool type, debitage). Percentage frequency data for eight Paleo and Early Archaic sites, or assemblage areas, for unifacial tools, bifacial tools, and debitage are provided in Table 11. These sites and assemblage areas include the Kassel (Lennox 1993), Tegis (Burger 1997), Fisher

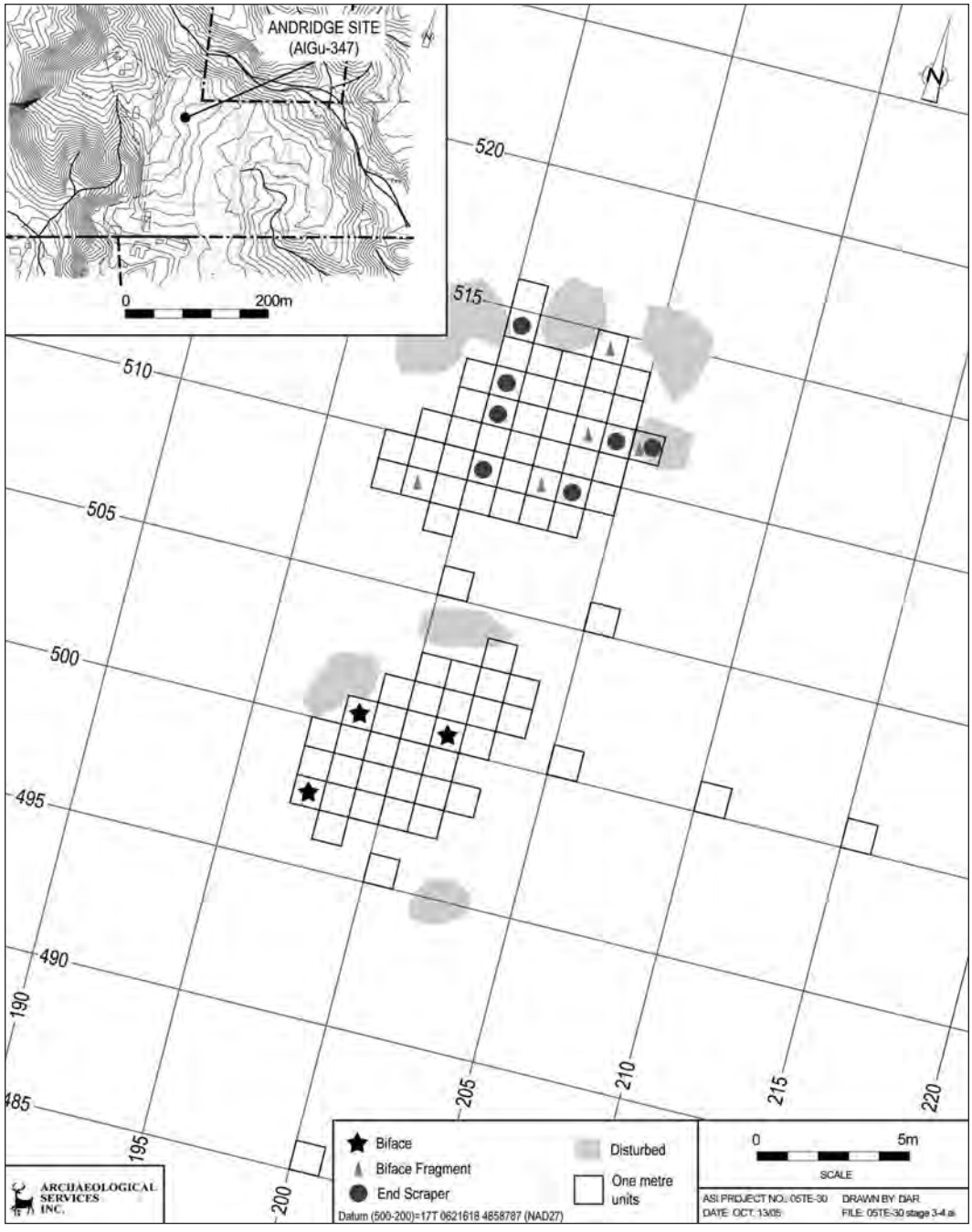

Figure 14. *Tool distribution at Andridge.*

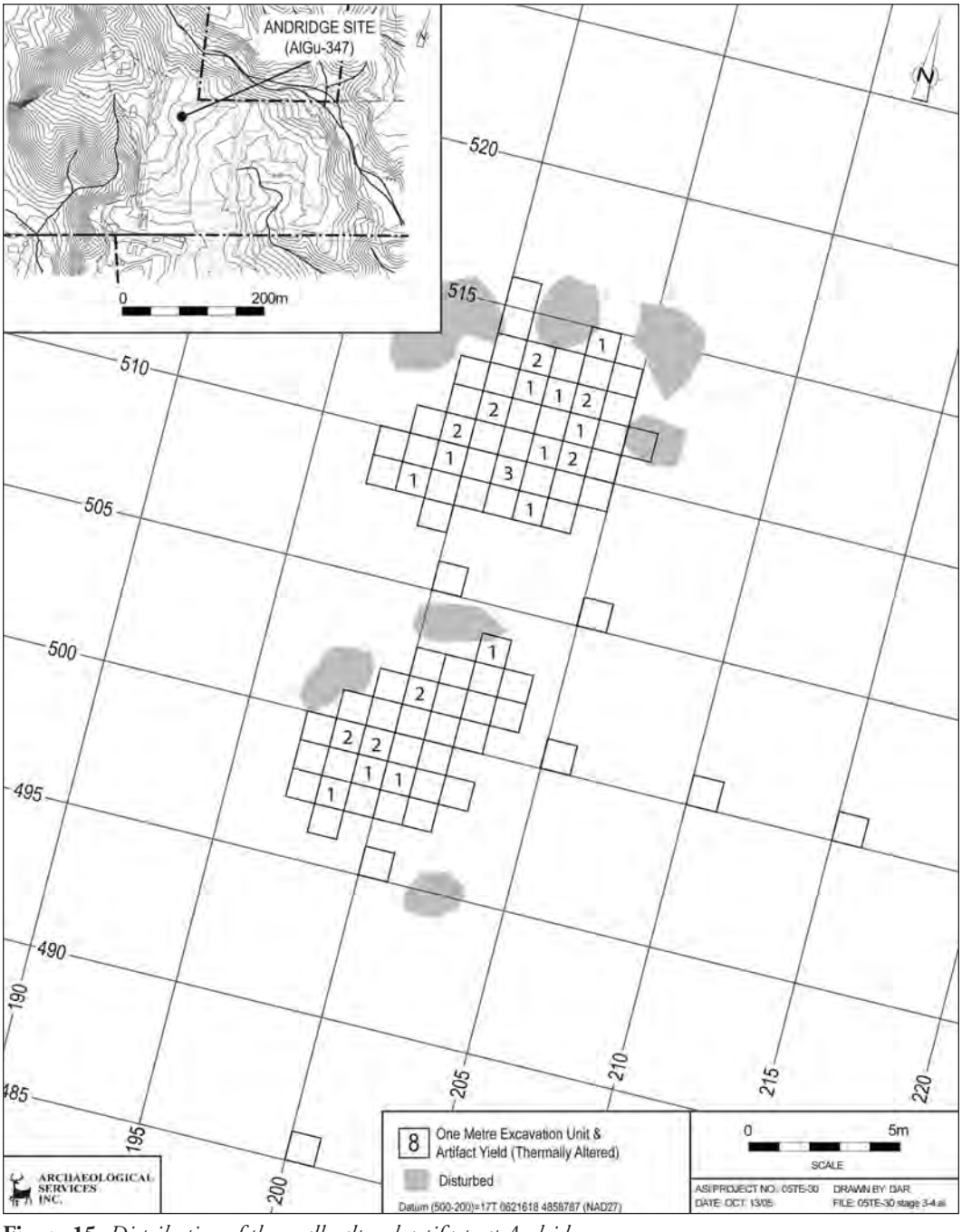

Figure 15. *Distribution of thermally altered artifacts at Andridge.*

Table 11. *Percentage and Total Number of Unifacial and Bifacial Artifacts and Debitage by Site, for Extensively Excavated and Published Paleo-Indian and Early Archaic Sites and Discrete Areas (identified by letter suffix) Within Sites in Southern Ontario, Ordered by Assemblage Size.*

Artifact Class	Andridge	Tegis	Kassel	Parkhill-D	Edgar	Parkhill-B	Fisher-D	Fisher-C
Bifacial	1.1	4.4	2.1	1.7	1.4	2.5	1.1	0.3
Unifacial	0.9	6.2	2.3	6.0	0.1	0.6	0.9	1.2
Debitage	98.0	89.4	95.5	92.3	98.5	96.8	98.1	98.5
Total (n)	**758**	**870**	**1163**	**1573**	**2974**	**3233**	**5981**	**7685**

Note: The class debitage includes flakes that are reported as "utilized" in some of the publications.

Table 12. *Percentage and Total Number of Tools by Type, by Site, for Extensively Excavated and Published Paleo-Indian and Early Archaic Sites and Discrete Areas (identified by letter suffix) Within Sites in Southern Ontario, Ordered by Assemblage Size.*

Artifact Class	Andridge	Tegis	Kassel	Parkhill-D	Edgar	Parkhill-B	Fisher-D	Fisher-C
Fluted point and preform	0	0	0	19.0	0	74.8	42.6	1.7
Serrated projectile point	0	20.2	0	0	22.2	0	0	0
Bifurcate projectile point and preform	0	0.0	15.4	0	0	0	0	0
Trianguloid knife	0	1.1	1.9	0	0	0	0	0
Bifacial drill or rod-like tool	0	2.1	3.8	0.0	4.4	0	0	0
Bifacial artifact/fragment (unspecified)	53.3	16.0	26.9	3.3	57.8	4.9	13.0	16.5
Unifacial perforator or graver	0	5.3	1.9	6.6	6.7	1.9	9.6	6.1
Beaked scraper	0	1.1	0.00	1.7	0	1.0	7.8	4.3
Concave scraper/spokeshave	0	2.1	1.9	0	4.4	0	4.3	8.7
End scraper	46.7	12.8	3.8	32.2	2.2	1.0	4.3	2.6
Unifacial artifact/fragment (unspecified)	0	37.2	44.2	37.2	2.2	16.5	18.3	60.0
Total (n)	**15**	**94**	**52**	**121**	**45**	**103**	**115**	**115**

(Storck 1997), and Parkhill (Ellis and Deller 2000) sites.

Parkhill-B and Fisher-D in Tables 11 and 12 are "specialized" assemblages within those Paleo sites, compared with other more "generalized" areas within the same sites. The nature or cause of specialization, for both sites, was attributed to discard, re-hafting, and manufacturing of fluted bifaces (Ellis and Deller 2000; Stewart 1997). Parkhill-D and Fisher-C are areas within those sites yielding "generalized" assemblages attributed to a wider range of domestic activities that possibly indicate base camps.

Like at Kassel and Fisher-D, the proportion of bifacial to unifacial tools is close to 1:1 at Andridge (Table 11). Edgar and Parkhill-B have a high proportion of bifacial tools relative to unifacial tools and appear quite specialized, while this proportion is reversed at Tegis, Parkhill-D, and Fisher-C, which have more unifacial tools and are more generalized activity areas.

Table 12 provides percentages for some of the tool types defined for Paleo and Early Archaic sites. The percentage of projectile points as a whole at the Early Archaic Kassel (15.4%) and Edgar (22.2%) sites, while substantial, is much lower than at either of the specialized areas at Fisher (43%) or Parkhill (75%), which were interpreted as projectile point retooling areas. Kassel is interpreted as a base camp, while Edgar appears to be more specialized than either the Kassel or Tegis sites, particularly because of the rarity of end scrapers and unifacial tool fragments at Edgar. Edgar has a large proportion of bifacial tools, relative to unifacial tools, compared with all other sites/areas, except for Parkhill-B, and at both Edgar and Parkhill the bifaces are almost exclusively points or preforms for the same. At Andridge, on the other hand, no projectile points were recovered, but eight (46.7%) of the formal tools were end scrapers. This contrast suggests that Andridge is a specialized site, perhaps where end scrapers were manufactured and used. The lack of cores and limited primary flaking debris (3%) also points to a relatively limited occupation, during which the full range of lithic reduction activities was not undertaken.

The Nettling site itself is a large site, with at least two clusters of material, possibly representing a pattern of mobility and settlement organization comparable in some ways to patterns inferred for the Paleo period (Ellis et al. 2009). The broad range of tools from that site suggest a more generalized occupation than at Edgar or Andridge. The frequency of Corner-Notched horizon sites in southern Ontario, however, suggests a higher population compared with the earlier Paleo period (Ellis et al. 2009:800).

Summary

The Edgar site is an Early Archaic, Corner-Notched horizon site, which yielded serrated, corner-notched projectile points similar to those from the Nettling site, thinned biface base fragments and drills—all consistent with early sites that date to circa 9,700–8,900 RCYBP (Ellis et al. 2009:796–801). Out of a total of five serrated projectile points, four are missing their tips. This suggests that the site may relate to "retooling" after a hunt, due to damage and breakage that had occurred. The Andridge site is also thought to date to the Early Archaic period due to the presence of unifacial spurred end scrapers with moderate to full dorsal flaking on two specimens that are of a size and shape consistent with those examples seen at other sites, such as Nettling.

The presence of a high proportion of secondary knapping and retouch flakes (Table 11), compared with other sites considered in this study, suggests that later-stage biface reduction and/or formal tool resharpening were important activities at both sites. There was limited evidence of primary reduction. Both sites appear to have been occupied on a short-term, seasonal basis and are not considered to have been base camps. Knappers at both sites relied almost exclusively on Onondaga chert, at considerable distance from potential primary sources, suggesting some continuing conservatism, like in the previous Paleo period, relying, that is, on favoured primary sources (for discussion, see Ellis et al. 2009:798–800). The non-Onondaga raw materials are local Ontario cherts rather than more exotic, for example, Ohio, cherts.

Despite the fact that the Andridge and Edgar sites date to the Early Archaic period and have two different (i.e., possibly complementary) functions, they were situated approximately 800 m apart,

which suggests that they were unlikely to have been used concurrently. The occurrence of multiple generalized and specialized areas at Paleo sites (Deller and Ellis 1992; Ellis and Deller 2000; Stewart 1997) raises the question whether one or more generalized areas had existed near Andridge and Edgar—areas that would have yielded diverse toolkits reflecting a wide range of domestic tasks. The potential for a productive environment in the vicinity of both sites suggests opportunities for seasonal population aggregation that may have necessitated both home bases and specialized task areas. Approximately 70 percent of Block 12 in OPA 400 is now developed, and to our knowledge, such sites have not yet been identified. The remaining conserved lands are wooded ravine systems, some with bordering setbacks at the edges of the tablelands.

A large number of Early Archaic findspots in Durham Region, east of the Edgar and Andridge sites, suggests extensive occupation of southern Ontario north of Lake Ontario during this period, with most of the occupation occurring on relatively well-drained substrate nearer the shore of the lake (Roberts 1985). More generally, there are about 525 Early Archaic sites (camps, scatters) and 367 findspots,[2] compared with 49 Paleo sites and 94 findspots (Hanson and Ellis 2012), in southern Ontario. These data suggest that despite environmental change from the previous period, there was population expansion in southern Ontario (see also Ellis et al. 2009:800).

While these sites are small, the investigation of these apparent task-specific locales can be seen to have contributed to an enhanced understanding of settlement types for the period.

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References Cited

Anderson, T. W., and C. F. M. Lewis
1985 Postglacial Water Level History of the Lake Ontario Basin. In *Quaternary Evolution of the Great Lakes*, edited by P. F. Karrow and P. E. Calkin, pp. 231–253. Special Paper No. 30. Geological Association of Canada, St John's.
2002 Upper Great Lakes Water Level Changes 11 to 7 ka: Effect on the Sheguiandah Archaeological Site. In *The Sheguiandah Site: Archaeological, Geological and Paleobotanical Studies at a Paleoindian Site on Manitoulin Island, Ontario*, edited by Patrick J. Julig, pp. 195–234. Mercury Series Paper No. 161. Archaeological Survey of Canada, Canadian Museum of Civilization, Gatineau, Québec.

Archaeological Services Inc. (ASI)
2007 Stage 3 & 4 Archaeological Investigation of the Edgar Site (AlGu-299) Lot 25, Concession 2, Block 12, OPA 400, Former Township of Vaughan, York County, City of Vaughan, Regional Municipality of York. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto. Copies available from OMTCS, Toronto.
2008 Final Stage 3–4 Archaeological Investigation of the Andridge Site (AlGu-347) Draft Plan of Subdivision 19T-99V08 Andridge Homes Limited., Part of Lot 24, Concession 2, Block 12 OPA 400, Geographic Township of Vaughan, County of York, Now the City of Vaughan, Regional Municipality of York, Ontario. Submitted to Ontario Ministry of Tourism, Culture and Sport, Toronto. Copies available from OMTCS, Toronto.

[2] Site statistics provided by Robert von Bitter, Archaeological Data Coordinator, Ministry of Heritage, Sport, Tourism and Culture Industries, March, 2020.

Bell, W. A.
1898 On the Occurrence of Mammoth and Mastodon Remains around Hudson Bay. *Bulletin of the Geological Society of America* 9:369–390.

Bennett, K. D.
1986 Holocene History of Forest Trees in Southern Ontario. *Canadian Journal of Botany* 65:1792–1801.

Burger, R. W. C.
1997 Points of View from the Tegis Site (AkGv-118): A Newly Defined Archaic Component in South-Central Ontario. In *Preceramic Southern Ontario*, edited by P. J. Woodley and P. Ramsden, pp. 3–27. Occasional Paper in Northeastern Archaeology No. 9. Copetown Press, Hamilton.

Deller, B., and C. J. Ellis
1992 *Thedford II: A Paleo-Indian Site in the Ausable River Watershed of Southwestern Ontario*. Memoir No. 24. Museum of Anthropology, University of Michigan, Ann Arbor.

Ellis, C. J.
2018 The Archaic: The Black Hole of Southern Ontario Archaeology. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 18(6–8):2–28.

Ellis, C. J., and D. B. Deller (with contributions by
W. B. Roosa, A. V. Morgan, and J. H. McAndrews)
2000 *An Early Paleo-Indian Site near Parkhill, Ontario*. Mercury Series Paper No. 159. Archaeological Survey of Canada, Canadian Museum of Civilization, Gatineau, Québec.

Ellis, C. J., A. C. Goodyear, D. F. Morse, and
K. B. Tankersley
1998 Archaeology of the Pleistocene–Holocene transition in eastern North America. *Quaternary International* 49/50:151–166.

Ellis, C. J., I. Kenyon, and M. Spence
1990 The Archaic. In *The Archaeology of Southern Ontario to A.D. 1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 65–124. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

Ellis, C. J., P. A. Timmins, and H. Martelle
2009 At the Crossroads and Periphery: The Archaic Archaeological Record of Southern Ontario. In *Archaic Societies: Diversity and Complexity across the Midcontinent*, edited by T. E. Emerson, A. Fortier, and D. McElrath, pp. 787–837. State University of New York Press, Albany.

Ellis, C. J., S. Wortner, and W. Fox
1991 Nettling: An Overview of an Early Archaic "Kirk Corner-Notched Cluster" Site in Southwestern Ontario. *Canadian Journal of Archaeology* 15:1–34.

Environment Canada
2007 Canadian Climate Normals 1971–2000. Electronic document, http://www. climate. weatheroffice.ec.gc. ca, accessed January 15, 2007.

Frink, D., and A. Hathaway
2003 Behavioral Continuity on a Changing Landscape. In *Geoarchaeology of Landscapes in the Glaciated Northeast,* edited by D. L. Cremeens and J. D. Hart, pp. 103–116. Bulletin No. 497. New York State Museum, Albany.

Haas, J. N., and J. H. McAndrews
2000 The Summer Drought Related Hemlock (Tsuga canadensis) Decline in Eastern North America, 5,700 to 5,100 years ago. In *Proceedings: Symposium on Sustainable Management of Hemlock Ecosystems in Eastern North America,* pp. 81–88. Electronic document, http://www. fs. fed. us/na/ morgantown/hemlock_proceedings/hemlock proceedings index. html, accessed January 20, 2007.

Hanson, C., and C. J. Ellis
2012 An Updated Fluted Point Survey for Southern Ontario. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society]12(1–2):8–11.

Jones, B. D., and D. T. Forrest
2003 Life in a Postglacial Landscape: Settlement–Subsistence Change during the Pleistocene–Holocene Transition in Southern New England. In *Geoarchaeology of Landscapes in the Glaciated Northeast,* edited

by D. L. Cremeens and J. D. Hart, pp. 75–89. Bulletin No. 497. New York State Museum, Albany.

Karrow, P. F.
1970 Pleistocene Geology of the Thornhill Area. Industrial Mineral Report No. 32 and Preliminary Geology Map P. 244. Scale 1:25,000. Ontario Departments of Mines, Toronto.
2005 Quaternary Geology, Brampton Area. Ontario Geological Survey Report No. 257 and Map 2223. Scale 1:50,000. Ministry of Northern Development and Mines, Sudbury.

Karrow, P. F., and B. G. Warner
1990 The Geological and Biological Environment for Human Occupation in Southern Ontario. In *The Archaeology of Southern Ontario to A.D.1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 5–35. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

Laub, R. S.
2006 New Developments Concerning the Pleistocene Component of the Hiscock Site (Western New York State). *Current Research in the Pleistocene* 23:119–121.

Lennox, P. A.
1986 The Innes Site: A Plow Disturbed Archaic Component, Brant County, Ontario. *Midcontinental Journal of Archaeology* 11: 221–268.
1993 The Kassel and Blue Dart Sites: Two Components of the Early Archaic, Bifurcate Base Projectile Point Tradition, Waterloo County, Ontario. *Ontario Archaeology* 56:1–31.

MacDonald, R. I.
2002 *Late Woodland Settlement Trends in South-Central Ontario: A Study of Ecological Relationships and Culture Change.* Unpublished Ph.D. dissertation, Department of Anthropology, McGill University, Montréal.

McAndrews, J. H.
1994 Pollen Diagrams for Southern Ontario Applied to Archaeology. In *Great Lakes Archaeology and Paleoecology: Exploring Interdisciplinary Initiatives for the Nineties,* edited by R. I. MacDonald, pp. 179–195. Publication No. 10. Quaternary Sciences Institute, University of Waterloo, Ontario.
2003 Postglacial Ecology of the Hiscock site. In *The Hiscock Site: Late Pleistocene and Holocene Paleoecology and Archaeology of Western New York State,* edited by R. S. Laub, pp. 190–198. Bulletin No. 37. Buffalo Society of Natural Sciences, Buffalo, New York.

McAndrews, J. H., and L. J. Jackson
1988 Age and Environment of Late Pleistocene Mastodont and Mammoth in Southern Ontario. In *Late Pleistocene and Early Holocene Paleoecology and Archeology of the Eastern Great Lakes Region*, edited by R. S. Laub, N. G. Miller, and D. W. Steadman, pp. 161–172. Bulletin No. 33. Buffalo Society of Natural Sciences, Buffalo, New York.

McMillan, K.
2003 *Hafted Diagnostic End Scrapers from the Nettling Site: Assessing Technological Change in the Paleoindian–Early Archaic Transition.* Unpublished M.A. thesis, Department of Anthropology, University of Western Ontario, London, Ontario.

Nicholas, G. P.
1988 Ecological Leveling: The Archaeology and Environmental Dynamics of Early Postglacial Land Use. In *Holocene Human Ecology in Northeastern North America*, edited by G. P. Nicholas, pp. 257–288. Plenum Press, New York.

Ontario Geological Survey (OGS)
2003 Surficial Geology of Southern Ontario. Miscellaneous Release Data 128 (CD-ROM; 2 vols.). Ontario Geological Survey, Sudbury.

Roberts, A. C. B.
1985 *Preceramic Occupations along the North Shore of Lake Ontario*. Mercury Series Paper No. 132. Archaeological Survey of Canada, National Museum of Man, Ottawa.

Sharpe, D. R.
1980 Quaternary Geology of the Toronto and Surrounding Area. Ontario Geological Survey Preliminary Map P 2204, Geological Series. Scale 1:100,000. Ontario Geological Survey, Department of Mines and Northern Development, Sudbury.

Sharpe, D. R., and P. J. Barnett
1997 Surficial Geology of the Markham Area, NTS 30M/14, Southern Ontario. Scale 1:50,000. Open File 3300. Geological Survey of Canada, Ottawa.

Stewart, A.
1997 Intra-Area Assemblage Patterning and Site Formation. In *The Fisher Site, Archaeological, Geological and Paleobotanical Studies at an Early Paleo-Indian Site in Southern Ontario,* edited by P. L. Storck, with contributions by B. Eley, Q. Gwyn, J. McAndrews, A. Nolin, A. Stewart, J. Tomenchuk, and P. von Bitter, pp. 163–188. Memoir No. 30. Museum of Anthropology, University of Michigan, Ann Arbor.

St Jacques, J.-M., M. S. V. Douglas, and J. H. McAndrews
2000 Mid-Holocene Hemlock Decline and Diatom Communities in van Nostrand Lake, Ontario, Canada. *Journal of Paleolimnology* 23:385–397.

Storck, P. L. (editor) (with contributions by B. Eley, Q. Gwyn, J. McAndrews, A. Nolin, A. Stewart, J. Tomenchuk and P. von Bitter)
1997 *The Fisher Site, Archaeological, Geological and Paleobotanical Studies at an Early Paleo-Indian Site in Southern Ontario*. Memoir No. 30. Museum of Anthropology, University of Michigan, Ann Arbor.

Timmins, P. A.
1996 The Little Shaver Site: Exploring Site Structure and Excavation Methodology on an Unploughed Site in the Region of Hamilton-Wentworth, Ontario. *Ontario Archaeology* 61:45–81.

Tomenchuk, J.
1997 A Parametric Use-Wear Study of Artifacts from Areas C and C-east. In *The Fisher Site: Archaeological, Geological and Paleobotanical Studies at an Early Paleo-Indian Site in Southern Ontario, Canada,* edited by P. L. Storck (with contributions by B. E. Eley, Q. H. J. Gwyn, J. H. McAndrews, A. Nolin, A. Stewart, J. Tomenchuk, and P. H von Bitter), pp. 95–161. Memoir No. 30. Museum of Anthropology, University of Michigan, Ann Arbor.

Webb, T., III, B. Shuman, P. Leduc, P. Newby, and N. Miller
2003 Late Quaternary Climate History of Western New York State. In *The Hiscock Site: Late Pleistocene and Holocene Paleoecology and Archaeology of Western New York State,* edited by R. S. Laub, pp. 11–17. Bulletin No. 37. Buffalo Society of Natural Sciences, Buffalo, New York.

Westgate, J. A., P. H. von Bitter, N. Eyles, J. H. McAndrews, V. Timmer, and K. W. F. Howard
1999 The Physical Setting: A Story of Changing Environments Through Time. In *Special Places: The Changing Ecosystems of the Toronto Region*, edited by B. L. Roots, D. A. Chant, and C. E. Heidenreich, pp. 11–31. UBC Press, Vancouver.

Yu, Z.
2000 Ecosystem Response to Lateglacial and Early Holocene Climate Oscillations in the Great Lakes Region of North America. *Quaternary Science Reviews* 19:1723–1747.

Les sites Edgar et Andridge, situés sur des cours d'eau d'amont du bras est de la rivière Don, ont été fouillés entre 2003 et 2006 dans le cadre de fouilles de récupération par Archaeological Services Inc. Cet article résume les analyses découlant des données recueillies sur le peuplement et la culture matérielle. Une reconstruction environnementale a été entreprise, laquelle a compris des examens de l'origine géomorphologique de la région,le climat, les caractéristiques du sol, la couverture végétale présumée ainsi que la disponibilité des ressources fauniques et botaniques. Ces éléments, assortis des données recueillies sur le site ont ensuite été comparés aux connaissances archéologiques du mode de vie à la fin de la période paléoindienne et du début de la période archaïque dans l'ensemble de la région afin d'interpréter la structure et les fonctions des deux sites. Bien que les sites Andridge et Edgar datent du début de la période archaïque et semblent avoir servi à des fonctions à la fois différentes et complémentaires, elles sont situées environ 800 mètres de l'une et de l'autre aux rives opposées du cours d'eau, ce qui semble suggérer qu'il est peu probable que les deux sites furent utilisés en même temps. La présence de multiples aires générales et spécialisées à des sites plus anciens soulève la question quant à savoir si une ou plusieurs aires générales auraient pu avoir servi près des sites Andridge et Edgar—endroits qui auraient permis de récupérer des trousses d'outils divers, reflétant un large éventail de tâches ménagères. L'étude des deux sites a néanmoins permis d'obtenir des données supplémentaires concernant l'utilisation du paysage par les chasseurs-cueilleurs qui habitaient dans la région de la rive nord du lac Ontario au début de la période archaïque.

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Profile

Politics and Dirt: W. J. Wintemberg in Toronto

Mima Brown Kapches

William John Wintemberg (WJW) is one of the most important twentieth-century archaeologists of Canada (Noble 1972; Trigger 1978; see Kapches 2019:Figure 2). He was born in New Dundee, Ontario, in 1876. He was fragile at birth, and, as a result of chronic health issues, he only briefly attended school. As a young adult, rather than working in his father's blacksmith shop, he was apprenticed to a tailor (Swayze 1960). But WJW did not want to be a tailor—instead he became a printer, as it allowed him to be closer to two of his loves: reading and buying books. His other interests included collecting: folk-lore stories, especially those from his Alsatian family and friends; examples of early forms of domestic lighting (lamps, lanterns, and early electric light fixtures); and, importantly, aboriginal artifacts from the many indigenous sites around his home in Washington, Oxford County, southwestern Ontario.

Canadian archaeologists are familiar with Wintemberg's life story and how his interest in archaeology led him to David Boyle at the Ontario Provincial Museum in Toronto. In the late nineteenth and early twentieth centuries, Boyle became his mentor, and after Boyle's death in 1911, he was hired at the Victoria Memorial Museum in Ottawa, where his professional archaeological career began and blossomed (1911–1941). When he was hired in Ottawa, he was no longer a young man. He was in his mid-thirties, and this begs the question: What had he been doing in Toronto to develop his career? This paper will look at Wintemberg's life in Toronto, where he transitioned from an amateur collector to an archaeologist. I have titled this Profile "Politics and Dirt" because of the "politics" of the Ontario Provincial Museum (OPM) and the Ontario Ministry of Education, which presented obstacles to WJW while he pursued the study of "dirt" archaeology.

Wintemberg's first association with the OPM came about in 1894–1895, when his father, Frank, donated two ground stone tools found near Washington (Boyle 1896:17, 68–69). Once a donation was made to the museum, donors received, *gratis*, a copy of the *AARO* (Annual Archaeological Report Ontario). The first of WJW's extant letters to Boyle was penned January 27, 1898 (Royal Ontario Museum, Library and Archives, Toronto [ROM], David Boyle Correspondence [DB]). In it, he explains to Boyle that he exchanged a collection of his ancient relics with a man in New York State. The man's collection sent to him was being held in bond, in Paris, with a fee of $1.50 required to claim it; WJW asked: "Now is this charge a proper one?" He mentioned a letter from Boyle several years earlier (October 1895) in which Boyle wrote, "If the customs officer will refer to his tariff book he will find under No. 553 'bones, medals and antiquities free.'" WJW wanted to know if this rule had been changed and asked Boyle to respond immediately, adding, "rather than pay the price they demand, I will let the parcel rot in the customs office." He also asked for names of men who exchange relics from Europe, because he wished to increase the size of his collection for

comparison and study. He added that he should like to see the "Archae. Museum collections" but hadn't had occasion to visit Toronto. After discussing some bone artifacts he has found, he concludes the letter by adding that he has some folk-lore notes: "if you want I can send them in?" From this letter, it's apparent that they had some correspondence dating to the time that his father donated the stone artifacts but that in the 1898 letter they are still in the early phase of their acquaintance. Neither seems to know very much about the other, and they have not met. I think this letter is important because it shows that at this time, early in his life, WJW was on the path of a typical relic collector, buying items as well as exchanging and selling parts of his collection.

In his next letter, dated 27 February 1898, Wintemberg began by thanking Boyle for the report (*AARO*) received, "Best report yet" (ROM:DB). He explained to Boyle that:

> I am—owing to continued delicate health—out of employment at my trade (printing) and desiring to obtain employment where I could be outside most of the time, and being, also, anxious to engage in scientific work, could you tell me, or do you know any person engaged in archaeological or biological field work with whom I could get employment as an assistant? [ROM:DB].

This letter is unique in that it's the only one I'm aware of in which he admits to his physical frailties. We do not have Boyle's response, but one can only imagine what he thought of WJW's future in archaeology considering his physical limitations. At this time, WJW was 22 and Boyle was 56, and to add to Boyle's possible bemusement was the fact that the stationery was personalized somewhat boldly with "W. J. WINTEMBERG, Archaeologist" (Figure 1). I

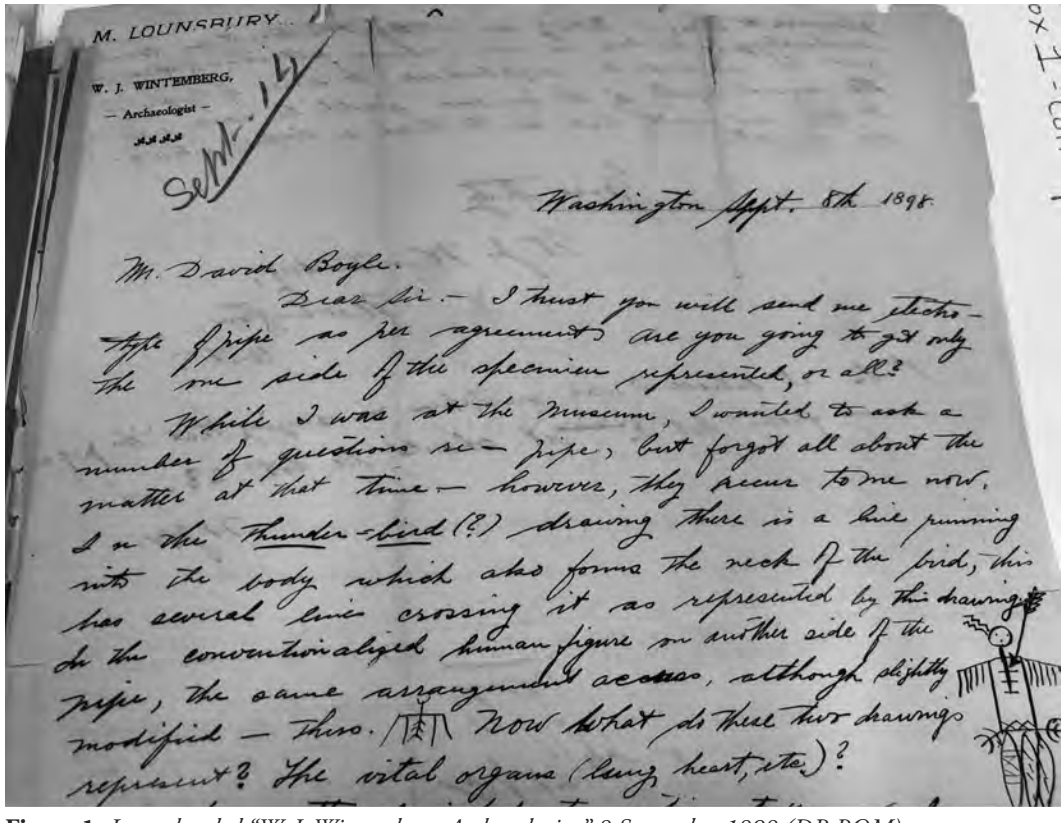

Figure 1. *Letter headed "W. J. Wintemberg, Archaeologist," 8 September 1898 (DB:ROM).*

assume that one benefit of being a printer is the ability to design and produce one's own stationery.

By late August or early September of 1898, WJW had been to Toronto and met Boyle, the occasion for the trip being the donation of a unique, stemless stone pipe etched with a thunderbird and other motifs. A recap of the donation and their first meeting is covered in WJW's letter of 8 September 1898 (ROM:DB). In this, Wintemberg also asks for extra copies of the 1896 and 1897 *AARO*s, as his are "without covers (or are otherwise soiled and mutilated)." WJW surveyed for sites in the county riding his bicycle, and doubtless his paper-bound reports were quite tattered from heavy use (3 May 1903, ROM:DB). The story of this pipe donation took another turn when, in his next letter, WJW wrote Boyle in distress, having just learned from Boyle that the pipe had gone missing and was presumed stolen (29 September 1898, ROM:DB). Wintemberg stated that he "almost wished he had not left the pipe at the museum; but this does not necessarily imply—if some unscrupulous person wishes to appropriate anything that he takes a fancy to—that any blame attaches to you." He finished by writing, "Trusting that the pipe will 'turn up' before long…." Nearly one month later, 1 November 1898, WJW wrote Boyle expressing relief that the pipe had been located. Wintemberg and Boyle had apparently discussed who could have taken the pipe, but since there is no one named in the letters, the "borrower" of the pipe will remain a mystery (ROM:DB). This pipe is highlighted in the *AARO* for 1898 (Boyle 1898:46-47, Figures 5–8) as "a plainly formed stone pipe, found by Mr. W. J. Wintemberg (an intelligent and enthusiastic student of archaeology)." From the tone of WJW's letter and Boyle's *AARO* comment, it would appear that the two men, the young enthusiast and the old mentor, liked each other, and that this event marked the beginning of a positive relationship. Importantly, with regard to the development of Wintemberg's archaeological ethics, he chose to donate this unusual pipe to a public institution, rather than keep it in his personal collection, a step which would have garnered Boyle's approval.

On 27 June 1899 (ROM:DB), WJW asked Boyle about a job as his assistant: "Should you gain consent of the Minister, would you kindly let me have the chance?" The OPM was in the Ontario Department of Education, and their offices and exhibition space were in the Normal School (Killan 1983). It was through the Department of Education that the OPM got its funding. As well, government printers were employed for the publication of the *AARO*s, at no cost to the museum. Boyle had an overwhelming workload, one reason for which was his position as Secretary of the Ontario Historical Society (OHS). The OHS had been founded in 1898 and received a grant from the Ministry of Education, from which Boyle was paid $100 per annum (Killan 1983:186–189). The OHS operations were run by Boyle from the OPM. Even though Boyle did need help, he himself could not hire an assistant, as all hiring had to be done through the Minister. This problem resulted in the first instance of politics interfering in WJW's Toronto career.

Boyle submitted his resignation as Secretary of the OHS in November of 1900, but it was not accepted (Killan 1983:205–206). Knowing Boyle needed help, members of the OHS executive lobbied the government to hire an assistant. Andrew F. Hunter, the Simcoe County archaeologist (also a member of the OHS executive), desperately wanted the OHS job, but more importantly, he wanted to be Boyle's assistant at the OPM. There are a series of letters, all sent by Hunter on 19 November 1900, to various individuals to plead his case (Simcoe County Archives [SCA], Andrew F. Hunter Archives [AFH]). One letter was to James Bain, the President of the Canadian Institute. In this missive, Hunter stated that he had written to the Minister of Education, the Hon. Mr. Harcourt, to apply for the position of assistant, and that he wished Mr. Bain to support him in discussions with the Premier, the Hon. Mr. G. W. Ross. Hunter also wrote to a Mr. Davidson, who appears to be from the provincial Barrie Liberal Association. Hunter felt that he was entitled to the job for two reasons. First, he had worked in archaeology at his own expense for 20 years, and, second, in the letter to Mr. Davidson, he

emphasized that he was a loyal Liberal who had supported the party for 17 years (19 November 1900, SCA:AFH). The Ross government was Liberal, and Hunter was looking for a patronage appointment. Hunter was upset that other MPPs were supporting the appointment of Wintemberg, "who by the way is a conservative" (19 November 1900, SCA:AFH).

In his application letter to Boyle, Hunter states, "I can make photographs, operate a typewriter, go errands on a bicycle, drive nails, clean windows, parlez-vous-Francais, and in short make myself generally useful." Boyle wrote back to him, on 20 November 1900, that it was news to him they were considering an appointment (SCA:AFH). Considering how well-connected Boyle was, I doubt this was true. In a post-script added to this letter, Boyle notes that two MPPs had discussed Mr. Wintemberg with the Minister. In the end, the Minister did not hire an assistant, choosing instead to give Mr. Boyle a typewriter (20 November 1900, SCA:AFH). James Coyne, who was President of the OHS, wrote Hunter, "personally I would prefer to see you appointed, rather than Mr. Wintemberg, although I consider the latter a promising student of archaeology" (1 December 1900, SCA:AFH). Another major factor here, and well known by all involved, was that Hunter and Boyle did not get along. Hunter wrote Bain about Boyle, "The man is now completely insane, and his lunatic malignity knows no bounds" (7 May 1903, SCA:AFH). Hunter was never hired at the OPM, but he did eventually become the Secretary of the OHS (serving from 1913 to 1931). Apparently, Wintemberg initially did not know that his name was being put forward, and the moment he knew that Hunter had applied, he wrote Boyle that "in view of the fact that Mr. Hunter was in the field it would be utterly presumptuous of me to hope of getting the appointment, considering Mr. Hunter's superior qualifications..." (17 February 1901, ROM:DB).

During these years, WJW was living off and on in Washington, helping his father and working in the fields (6 October 1901, ROM:DB). Boyle hired him to work for him at the Pan-American Exposition in Buffalo (1901). In the spring of 1903, he was again back in Washington, and he mentioned to Boyle "if the Minister were to appoint me ("or invite me") to do fieldwork, as he did last summer…" (3 May 1903, ROM:DB). His fieldwork in 1902 was a survey of Blenheim Township and also included some survey work in Blanford, which he completed in 1912 (Wintemberg 1903, 1913:188). It seems that he moved full time to Toronto sometime in 1904. In the city, he did sporadic work for Boyle, including assisting at the 1904 St. Louis World's Fair. However, his main employment over these years was as a printer, compositor, and copper worker (Jenness 1941; Kapches 2019). Being in Toronto meant that WJW could talk with Boyle and study the collections at the OPM, but it also meant that their correspondence ceased.

With Boyle's encouragement, Wintemberg published several papers in the *AARO*s (Wintemberg 1900, 1901, 1902, 1903). Wintemberg wrote Boyle: "Do not hesitate to make such corrections as you may see fit. A little wholesome criticism and correction never does any harm…. I might say that if any awkward German idiom crept in, somewhere in my notes, you would oblige me by correcting the same" (22 November 1901, ROM:DB).

The Oxford, Waterloo, and Blenheim papers (Wintemberg, 1900, 1901, 1903) are modelled on A. F. Hunter's Simcoe County surveys. The report on the fish-weir (Wintemberg 1902) required WJW to visit the site and make first-hand observations. In the end, it was "provisionally" considered to be a fish-weir of aboriginal construction.

His subsequent artifact studies of bone needles, bone and horn harpoons, and shell objects (Wintemberg 1905a, 1906, 1908, respectively) show that he had access to the OPM collections. In the article on bone needles, he observes that the type of needles with an eye in the middle may have been introduced by Europeans. At the end of Wintemberg's article, Boyle publishes a criticism of WJW for this suggestion, writing that "it seems utterly unreasonable to claim a European origin for eyed, bone needles…" (Boyle 1905b:42). However, Boyle's final comment is conciliatory: "Mr. Wintemberg is a

close and intelligent observer, and his remarks are worthy of consideration" (Boyle 1905b:42). At the time WJW wrote this article, he was living in Toronto. Since Boyle was the editor of the *AARO*s he would have had the opportunity to discuss Wintemberg's conclusions with him in person prior to publication. Perhaps he did, and perhaps he didn't. Ultimately, we'll never know why Boyle chose to publicly criticize Wintemberg. I do think it rather petty of Boyle to choose this form of public chastisement.

Not only did WJW have access to the collections, he was, through his research, able to correspond with the "who's who" of North American archaeologists: Ami of the Geological Survey of Canada; W. C. Mills, Curator and Librarian of the Ohio Archaeological and Historical Society; O. T. Mason and W. Hough of the U.S. National Museum, Washington, D.C.; and Beauchamp of the N.Y. State Museum. WJW also published internationally with the article "Relics of the Attiwandarons" (1905b) in the journal *Records of the Past*, published in Washington, D.C., and a similar article, "Attawandaron Pottery," in *The Reliquary and Illustrated Archaeologist* (1907), published in London.

Early in his correspondence with Boyle, WJW wrote that he had decided to donate his entire collection to the Oxford County Historical Society (27 February 1898: ROM:DB). However, in 1902, he donated his sizable collection to the Ontario Provincial Museum (Boyle 1903:12–21). The Normal School number series, NS23963 to NS24694 (731 entries), includes artifacts from several sites in the townships around his Washington home, as well as purchases and trades of artifacts from several American states, as well as China and Costa Rica. In his article on Blenheim Township, he concludes that collectors spurred by mercenary motives

> …offer fabulous prices for everything that is curious, and the finders, knowing full well that some collectors, with more money than brains, will pay it…this frequently results in a scientifically valuable relic finding its way into some obscure collection…. This shows how important it is that the Department should make every effort to secure valuable material and information before it is too late [Wintemberg 1903:69].

In sum, it is clear that by 1903, Wintemberg had become a scientific archaeologist; he was no longer just a collector, and it seems he was positioning himself to be Boyle's assistant, should such a position be approved.

As the twentieth century commenced, Boyle was still in need of assistance. In the AARO for 1904, he wrote, "There is now enough work to employ a general assistant and to keep an expert maker of labels busy continuously (Boyle 1905a:6)." In January of 1905, the Conservatives came into power in Ontario. They increased the budget of the museum, including Boyle's salary. Apparently, the Premier, J. P. Whitney, loved the museum and spent many hours visiting when he was in town as a Conservative MPP (Killan 1983:215–217). So, in the AARO for 1905, Boyle was able to thank the Education Minister, the Hon. Mr. Pyne, for the "additional assistance you have provided…" (Boyle 1906:5).

In the *AARO* for 1906, Boyle mentioned a Mr. W. H. C. Phillips, who was hired as "Assistant Curator" (Boyle 1907:15). Phillips appears twice in the *AARO*s. He authored an article titled "Rock Paintings at Temagami District," comprising two pages of text and five pages of illustrations (Phillips 1907). On an expedition to Temagami, in June of 1906, Phillips had brought photographic equipment to document the paintings, but decided that photographing from near the paintings, which would have necessitated photographing from the lake, in a rocking canoe, was impossible. He also noted that "the black flies and mosquitoes were very numerous and persistent" (Phillips 1907: 41). Unable to photograph, he made the sketches that appear in the article. Also in September of 1906, Phillips visited the Solid Comfort Camp, also known as the Humberstone Club, Port Colborne, Ontario (Boyle 1907:15). Here, wealthy Americans from Tennessee summered on the north shore of Lake Erie. In 1889, while erecting a flagpole, someone had discovered native remains. Boyle had made investigations then, and "ever since it has been our

desire to make something like a thorough examination" (Boyle 1907:15). In the summer of 1906, Boyle was absent from the museum on a cross-Canada and USA tour (Killan 1983:220), so the Deputy Minister of Education "authorized Mr. W. H. C. Phillips to proceed at once to the spot, the result being confirmatory of the belief that the mound had been constructed for a place of burial…" (Boyle 1907:15). The recovery of European artifacts dates this as a seventeenth-century Attawandaron burial.

Who was Mr. Phillips and what were his credentials? Might's Directory for the City of Toronto of 1906 shows that Mr. W. H. C. Phillips was a stenographer. In Might's Directory of 1912, he is listed as an "asst. curator." So he managed to stay at the OPM for 6 years, but I could not find him in the directory after 1912. What about other listings? In 1908, his listing said, "see W. K. Snider." Puzzled, I looked for the Snider listing and found "Snider, Wm. K, Organizer, the Provincial Liberal-Conservative Organization of Ontario." This was the office of the Ontario Conservative Party. Years later, on 4 August 1932, WJW wrote to Peter M. Pringle that Phillips "...never had any training..." (Canadian Museum of History, Gatineau, Québec [CMH], William J. Wintemberg Correspondence [WJW]). Diamond Jenness, in WJW's obituary (1941), was blunt when he said "the Provincial Government did not fully appreciate Boyle's needs and supplied him instead [of WJW] with a good party member who could not distinguish an arrowhead from an axe.…" Patronage could not get neither Hunter or Wintemberg hired, but it worked for Mr. Phillips. One can only imagine the consternation of Boyle, Hunter, and Wintemberg at this turn of events. For a second time, WJW's career in Toronto was thwarted by "politics."

Wintemberg developed other interests while in Toronto. Through his research, he became more knowledgeable about indigenous issues across Canada. In a letter to the editor of the *Toronto Star* newspaper, he wondered why Prince Rupert, B.C., wasn't named after a distinguished Canadian, "or better still, Indian names, of which we have far too few in our country" (19 February 1906). He also gave talks, such as, "Myths and Fancies of the Milky Way" to the Royal Astronomical Society at the Canadian Institute (*Globe*, 28 April 1908). In 1908, he undertook the initiative to found the Canadian Folk-Lore Society, asking "all those interested in the study of folk-lore" to write him (*Globe*, 7 March 1908). Meetings were held starting in 1909, and at the first annual meeting, WJW, the society's secretary, presented a history of the activities of folk-lorists, including the late David Boyle, who had collected and studied folk-lore for many years (*Globe*, 27 February 1911).

Diamond Jenness (1941) wrote that these Toronto years were difficult because WJW toiled in jobs as a printer and coppersmith for many hours a day, with poor wages. They were also frustrating, because when there were opportunities for employment in archaeology, politics intervened. But on the whole, it's fair to say that for WJW, they were intellectually rewarding years. With his publications, his attendance at expositions on behalf of the museum, and his field work, Wintemberg had established a reputation and had made connections with other American archaeologists. Then, in February of 1911, with Boyle's death, Wintemberg lost his mentor and possibly friend. Chances of being hired at the OPM became slight. In desperation, in June of 1911, he wrote Dr. Edward Sapir, of the Geological Survey of Canada and the new national museum (Canadian Museum of History, Gatineau, Québec [CMH], Edward Sapir Correspondence [ES]), with

> …confidential enquiries…I have for years been interesting myself in archaeological work with the hope of eventually making it my life work. Political exigencies, however, have deprived me of the right to make a living at it, although the positions here in Ontario are now filled by men (political appointees) who are not professional archaeologists… Is there any opening for an assistant archaeologist…? [CMH:ES].

Sapir knew Wintemberg through the folk-lore society, and hired WJW on a contract as a field worker for 1911 and then as a full-time employee, a preparator, in 1912. His first large-scale

excavation for the museum was that same year, at the Roebuck site, where he was supervised by Harlan I. Smith. With this appointment, his dream of becoming an archaeologist, first boldly announced on his stationery some 14 years earlier, was fulfilled, and Wintemberg's archaeological career began. As they say, the rest is history.

Acknowledgements. My research on Wintemberg was stimulated by the need to understand what was happening in his career while he interacted with Peter Marshall Pringle, starting in 1931 and continuing up to WJW's death in 1941. This research led to the little-studied period before he was hired at the Victoria Memorial Museum in Ottawa. This time was a complicated one, with a fair bit of political intrigue, which I casually titled "Politics and Dirt." In the time of self-isolation, during the Covid-19 pandemic, I began posting some of this story on the Ontario Archaeological Society's Facebook page, one post a day, starting 15 March 2020. These posts, which continued to 1 July 2020, include many images that will not appear in this article, so readers wishing more visuals can look for them there. During the course of this research, I came across the personal account of Dr. C. H. D. Clarke's friendship with Wintemberg from 1935 to 1941. This resulted in a companion piece to this paper, which will also appear in *Ontario Archaeology* in the Profile series (Kapches 2019). For access to correspondence, I would like to thank Brendan Edwards, ROM Library and Archives; April Hawkins of the Department of World Cultures, ROM; Benoit Theriault of the Archives of the Canadian Museum of History; and the staff of the Simcoe County Archives, Midhurst, Ontario. Also, I thank Andrew Stewart and Chris Ellis for their thoughtful use of their editorial skills in helping me to bring this paper to publication.

References Cited

Boyle, D.
1896 Accessions to the Museum. In *Annual Archaeological Report for Ontario for 1894-95*, pp. 7–27, 68–69. Ministry of Education, Toronto.
1898 Stone Pipes, In *Annual Archaeological Report for Ontario for 1897-8*, pp. 46–49. Ministry of Education, Toronto.
1903 Accessions to the Museum., In *Annual Archaeological Report for Ontario for 1902*, pp. 5–24. Ministry of Education, Toronto.
1905a Archaeological Report, 1904. Letter to Hon. R.A. Pyne, M.D., LL.D., Minister of Education, In *Annual Archaeological Report for Ontario for 1904*, pp. 5–6. Ministry of Education, Toronto.
1905b Editorial Addendum to "Are the Perforated Bone Needles Prehistoric?" In *Annual Archaeological Report for Ontario for 1904*, p. 42. Ministry of Education, Toronto.
1906 Presentation. In *Annual Archaeological Report for Ontario for 1905*, p. 5. Ministry of Education, Toronto.
1907 *Pottery, In Annual Archaeological Report for Ontario for 1906*, pp. 15–18. Ministry of Education, Toronto.

Jenness, D.
1941 William John Wintemberg 1876–1941. *American Antiquity* 7(1):64–66.

Kapches, M. B.
2019 Dr. C. H. D. Clarke's Reminiscences about W. J. Wintemberg. *Ontario Archaeology* 99: this issue.

Killan, G.
1983 *David Boyle from Artisan to Archaeologist.* University of Toronto Press, Toronto.

Noble, W. C.
1972 One Hundred and Twenty-Five Years of Canadian Archaeology. *Bulletin* [newsletter of the Canadian Archaeological Association] 4:1–78.

Phillips, W. H. C.
1907 Rock Paintings at Temagami District. In *Annual Archaeological Report Ontario for 1906,* pp. 41–47. Ministry of Education, Toronto.

Swayze, N.
1960 *The Man Hunters: Jenness, Barbeau, Wintemberg*. Clarke, Irwin & Company, Toronto.

Trigger, B. G.
1978 William J. Wintemberg: Iroquoian Archaeologist. In *Essays in Northeastern Anthropology in Memory of Marian E. White*, edited by W. E. Engelbrecht and D. K. Grayson, pp. 5–21. Occasional Papers in Northeastern Anthropology, No. 5. Man in the Northeast, Rindge, NH.

Wintemberg, W. J.
1900 Indian Village Sites in the Counties of Oxford and Waterloo. In *Annual Archaeological Report Ontario for 1899*, pp. 83–92. Ministry of Education, Toronto.
1901 Indian Village Sites in the Counties of Oxford and Waterloo. In *Annual Archaeological Report Ontario for 1900*, pp. 37–40. Ministry of Education, Toronto.
1902 Report upon a Supposed Aboriginal Fish-Weir in Burgess Lake, Near Drumbo, Ontario. In *Annual Archaeological Report Ontario for 1901*, pp. 35–38. Ministry of Education, Toronto.
1903 The Archaeology of Blenheim Township. In *Annual Archaeological Report Ontario for 1902*, pp. 58–70. Ministry of Education, Toronto.
1905a Are the Perforated Bone Needles Prehistoric? In *Annual Archaeological Report Ontario for 1904*, pp. 39–42. Ministry of Education, Toronto.
1905b Relics of the Attiwandarons. *Records of the Past* 6(9):266–275.
1906 Bone and Horn Harpoon Heads of the Ontario Indians. In *Annual Archaeological Report Ontario for 1905*, pp. 33–56. Ministry of Education, Toronto.
1907 Attawandaron Pottery. *The Reliquary and Illustrated Archaeologist*: N. S.12:271–277.
1908 The Use of Shells by the Ontario Indians. In *Annual Archaeological Report Ontario for1907*, pp. 38–90. Ministry of Education, Toronto.
1913 The Archaeology of Blanford Township, Oxford County. *Victoria Memorial Museum Bulletin* 1:187–200.

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Profile

C. H. D. Clarke Reminisces about W. J. Wintemberg

Mima Brown Kapches

In *Arch Notes* of June 1962 is a brief account of an Ontario Archaeological Society (OAS) meeting the preceding April at which Professor T. F. McIlwraith and Dr. C. H. D. Clarke gave a talk about W. J. Wintemberg (Soucy 1962:3), whom many regard as the great Canadian archaeologist of the early twentieth century. In her account, Soucy wrote, "Members interested in reading further about Wintemberg were referred by Professor McIlwraith to Nansi Swayze's book The Man Hunters..." Published in 1960, this book provided informal portraits of Wintemberg, Marius Barbeau, and Diamond Jenness. Swayze's article remains the definitive piece about Wintemberg. She never met him; she based her profile on interviews with family, colleagues, and friends. It's clear that she interviewed Wilfrid Jury, whose memories about Wintemberg at the Southwold site in 1935 appear in her article (Museum of Ontario Archaeology [MOA], Wilfrid Jury Archives [Jury]). Other archaeologists have written about Wintemberg and his time in Ottawa (1912 to 1941), when his impact on the development of Canadian archaeology was profound (Noble 1972; Mackie 1995; Trigger 1978). But none of these writers personally knew the man. So, although we know about his academic contributions to Canadian archaeology, we have few personal recollections of him.

To find out more about Clarke, and how he came to know Wintemberg, I sought out the Clarke archives at the Thomas Fisher Rare Book Library, at the University of Toronto. I hoped there would be some correspondence with WJW. None was found, but, happily, there was a file labelled "W.J. Wintemberg" (Thomas Fisher Rare Book Library, University of Toronto [Fisher] Charles Henry Douglas Clarke Papers [Clarke] MSS Coll. 367, Box 7, Folder 48). With the assistance of archivist Kyle Pugh, I found that it contained 21 pages of handwritten pencil notes and at the top of the first page marked, in ink: "in part given at Ont. Arch. Soc." Even better than correspondence, this was Clarke's 1962 talk (Figure 1).

W. J. Wintemberg (1876–1941), was born in

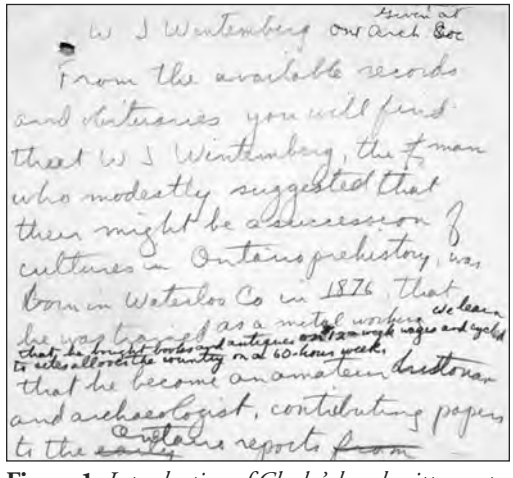
W J Wintemberg Ont Arch Soc
From the available records
and lectures you will find
that W J Wintemberg, the 1st man
who modestly suggested that
there might be a succession of
cultures in Ontario prehistory, was
born in Waterloo Co in 1876 that
he got started as a metal worker
that he brought books and antiques
to cities all over the country on a 60-hours week.
that he become an amateur historian
and archaeologist, contributing papers
to the early reports from

Figure 1. *Introduction of Clarke's handwritten notes for his talk to the Ontario Archaeological Society. Photograph by Kyle Pugh, Thomas Fisher Rare Book Library. Photo courtesy of the Charles Henry Douglas Clarke Papers, Thomas Fisher Rare Book Library, MSS 367, Box 7, Folder 58.*

New Dundee, a farming community in southwestern Ontario (Swayze 1960), his heritage was from his Pennsylvania Dutch German mother and his Alsatian French father. Perceived as sickly, he was encouraged to take up a non-strenuous career, in tailoring (which he rejected), and then in professional typesetting and copper-smithing. But his first love was collecting artifacts from archaeological sites around his home, an avocation which led him to David Boyle of the Ontario Provincial Museum in Toronto (Noble 1972) and to several fruitful years of friendship, mentorship, and part-time employment in the newly developing discipline of Ontario archaeology. In 1912, he was hired at the Victoria Memorial Museum, also known as the Dominion or National Museum, in Ottawa, where, under the tutelage of Harlan Smith and Diamond Jenness, his career opportunities expanded. With the financial support of the museum, he led major excavations in Ontario and eastern Canada (Figure 2) (Noble 1972). He was employed at the Dominion Museum until 1940, when he was superannuated. He died unexpectedly in 1941.

C. H. D. Clarke (1909–1981) was an Ontario-born wildlife biologist, who received his PhD (Toronto) in 1935 (Figure 3; Norment 1988). Doug (as he was known) was hired in 1935 at the Dominion Museum in Ottawa to investigate the muskox populations of northern Canada in the Thelon Game Sanctuary. His research indicated a respect for indigenous knowledge, not a common perspective at the time. In a study on caribou, he argued for the

> …protection of caribou…favouring native interests over those of whites in decisions regarding wildlife.… [He] was aware that increased resource development and hunting could threaten wildlife populations, and he suggested that the land should be protected for its wilderness value (Norment 1988:256).

In 1944, he moved to Toronto to work for the Ontario Department of Lands and Forests, eventually becoming chief of Fish and Wildlife. He died in 1981 in an ice fishing accident.

Clarke met Wintemberg in Ottawa, at the

Figure 2. *William J. Wintemberg at the Southwold site. Photo by Wilfrid Jury, 1935, courtesy of the Museum of Ontario Archaeology.*

Figure 3. *Charles H. D. Clarke in his Lands and Forests uniform. Photo courtesy of the Charles Henry Douglas Clarke Papers, Thomas Fisher Rare Book Library Part of MSS 367.*

National Museum. Later, after he had relocated to Toronto, he continued his interest in archaeology with friends at the Royal Ontario Museum (ROM) and the University of Toronto. While hunting (with his dog) near Pickering in the winter of 1954, he discovered the Boys and Carleton sites (Ridley 1958:18–19). In 1955, he wrote about the Grand Lake site (BlGk-1; Fisher: Clarke, MSS Coll. 367, Box 8, Folder 28) and the archaeology of Algonquin Park (Clarke 1956, 1957). In 1956, Clarke was one of the 11 founding members of the OAS. In 1957, he spoke at an OAS meeting "Of Bones and Things" and assisted in the excavation of the Fairty ossuary, as reported in *Arch Notes* 1957(1) and 1957(2). He was the first editor of *Ontario Archaeology* in the format that still exists today, namely, a journal that publishes original research articles (which started with volume 4, published in 1958). James Pendergast (1999:96) noted that he excavated sites on the Petawawa, Opeongo, and Muskrat rivers between 1955 and 1965. In 1966, he gave a talk at the March meeting of the OAS about his trip to Olduvai Gorge, as reported in *Arch Notes* 66(4).

In the handwritten notes of Clarke's talk are crossed-out phrases, as well as words added in here and there. He tells us about Wintemberg, or "Winty" as he was nicknamed, and we learn how Clarke, a young biologist with an interest in archaeology, met and got to know Wintemberg during his time at the Victoria Museum. Befriending this young and eager scholar, Wintemberg, in the twilight years of his career, would have remembered his student–mentor relationship many years earlier with David Boyle. These notes are the memories of that friendship and those days. Here is the full transcription, with its underlines and strikeouts:

> From the available records and obituaries you will find that W. J. Wintemberg, the man who modestly suggested that there might be a succession of cultures in Ontario prehistory, was born in Waterloo Co in <u>1876</u>, that he was trained as a metal worker, we learn that he bought books and antiques on $12 a week wages and cycled to sites all over the county on a 60-hour week, that he became an amateur historian and archaeologist, contributing papers to the ~~early~~ Ontario reports, and that in 1911 he was hired as an archaeologist at the National Museum of Canada, permanent in 1912,—a happy life of being paid for following his natural bent, and associating daily with those whom he most admired and enjoyed. He made his historic suggestion at the historic joint meeting of the Royal Society of Canada and the British Association at Toronto in 1924, when he had worked at Ottawa for 12 years. It was probably one of the best things spoken here, though notable things were spoken there ~~by such prophets as A. P. Coleman~~. Wintemberg certainly drew little attention, even though he did voice an opinion that ran counter to all accepted notions. Even in 1900 he wrote of "Neutral and pre-Neutral" sites in the Ontario Reports, for he was thinking about it then. His works were site reports you all know, produced by the earliest of scientific excavations in our area.
>
> The National Museum of Canada was started under the aegis of the Geological Survey at Ottawa, that was simply because the founders of that survey, Billings and Dawson, were men of genius whose interests were most catholic, who were willing to take other natural sciences under their protection, and Prof. Macoun, the first "naturalist" was a virtuoso no matter where he sat. The museum lived with the Survey for years in a rugged stone fortress ~~building~~ down by the Byward market. Just before the first world war great cultural plans were made for Canada, including an expanded Museum. An architectural competition was held, like the Toronto city hall, and in due course a design of a Douglas Fairbanks type structure was accepted and the building erected on the vacant lots at the end of Metcalfe and O'Connor Streets, at McLeod. I suppose that in the world one could not find an edifice less suited for the housing, study, or exhibition of scientific specimens. As I approach it, it always seems two-dimensional to me, and I can never get over the surprise of finding that

it is indeed a building and not a stage prop that you can walk right through.

When the Museum moved into the museum big brother Survey moved right in with them and occupied nearly all the space on most of the six levels. However, there was an expansion, and in this atmosphere Winty began to work.

I first went there in 1935 as a result of what was known as the Special Supplementary addition to the Geological Survey estimates after years of stifling depression economies. In the middle of the 1935 session, the government made a pre-election addition of one cool million dollars to the vote of the Geological Survey, ostensibly for a crash program to find new mineral wealth. Actually, no strings were attached, ~~and for once~~ as long as the money was spent by the Survey, and again, after a long lapse from the original patronage biology and anthropology got a little gravy from being in the Survey. The Survey had no men and no equipment in any of its branches and the field season was already started. Any survey unit, geological or otherwise, that could put someone in the field was begged to do so. From the far corners of Canada the flotsam of the depression with their PhD's won on scholarships of three or four hundred dollars a year came trooping to Ottawa. Some became famous—mostly the geologists, the biologists ~~some~~ like myself didn't last long. The section of the museum to which I went was forced right out of the Museum building by the expansion of the Survey, into an area above a downtown garage. There it stayed for years. Most of the rest compressed themselves into less space. During the war the whole lot nearly got moved back to the original building on the market, but, Canada was spared this final regression. During the move and at all times there was a great traipsing back and forth and I soon got to know all the staff at the main museum. There were the scientists and the technicians, with a few who were both. The help were a jovial crew who used to lunch down below away from the public. People like Claude Johnston, the artist, Clyde Patch, the herpetologist, Aurele Laroque, the conchologist—and Winty—joined them. Some of the other famous people like R. M. Anderson, Taverner, Porsild, Jenness, Dr. Alice Wilson, Leechman and a few more, ~~just didn't fit in~~ knew they would have ~~dampened~~ cooled the show and wisely stayed away. Curiously enough, C. M. Sternberg the paleontologist was often there surprising nobody from Toronto who knew his brother Levi. This is nothing against the distinguished gentlemen who stayed above, so did I, though my status surely inspired no awe.

I think I met Winty the first time I went there, luckily, in the atmosphere in which he relaxed, he had a long narrow work room on the third floor, where he worked perched on a high stool ~~beside~~ at a high laboratory bench. Rimsherds covered its full length, and he was perpetually engaged in making the most meticulous drawings. Once in a long while he would be at his desk at the far end, reading a publication, there were always plenty of these on his desk. Could a member of the OAS imagine such a scene?? I think so.

He was an extraordinary thin spare, frail looking man, who might have been tall except that he looked as if a truck had hit him in the chest and caved him in. ~~Whether he was born that way or not, I don't know but he really was frail~~. Readers of Nansi Swayze know that he was not expected to survive infancy, and never got to school. I did not know, he had no lung power at all, spoke in high strange wheeze, and had to fight every little virus that ran its course through town. He had a puckish face, and often seemed to look into space. There is a curious Anglo-Saxon idea that you are only half a man unless you ~~talk brassily and~~ stare people out of countenance, and ~~women must~~ put on a ~~friendly~~ tooth-showing front like a St. Bernard. ~~However, there are enough shifty eyed great men, that if I were young I could make bold to hope that I never stared anybody down~~. To our Indians and Eskimos

~~incidentally~~ staring is a form of physical aggression that children are taught to avoid. Children will look just the same, and often in conversation one would find Winty's German blue eyes on one, always when he was very earnest. He was however, physically incapable of being either loud or aggressive, even if he wished, and was painfully conscious both of his lack of education and his own worthiness. Anyone who even looked as if he cared about the former or did not realize the latter provoked an extreme of withdrawal.

Winty would clam up on most people, but if he felt fine, he enjoyed talk, and would take any side of an argument just for the fun of it. For this reason he was a great favourite at lunch time in the sub-basement. He especially enjoyed provoking Perron, an old and incredibly ignorant and naïve Franco-Canadian, who cleaned bones in Zoology without having the faintest idea why. He too loved to talk, and when provoked would produce sophisms of a Drummond-like nature which Winty found fascinating. On one occasion Winty took a stand against all religion and gave Perron a rebuttal on every point, until the old man, to Winty's glee, said "Well, h'anway, w'en you die, I h'am sorry for you. Dere you h'are, all dress h'up, and no-place to go!"

Speaking of the museum being kicked around, I was told during an early visit of something that happened during the first war. One evening the Parliament Buildings caught fire. Within a few minutes it became evident that, whatever would come, the Speakers and the Hon. Associates of both houses would have to deliberate elsewhere. Long before the fire reached its peak a decision had been made to use the museum, the staff, all of them, had been summoned from their homes, to work all night, and, when the time came to open as usual next morning, galleries had been cleared, exhibits had been stored, and space had been found for both Houses and all their functionaries, so that everything went on as usual, even though the fire up on the Hill was still burning.

There was only one hitch. A sign appeared at the door of the gallery dedicated as Senate Chamber, ~~set in a sign holder~~ in such a way that it might have got there by accident. The press gallery came to admire and soon the country was convulsed and nobody ever believed that it really was an accident. There were at the time, and have been since, many versions of that sign, despite obvious perfection your journalist [Clarke] has to edit everything, no matter how perfect the original, but I can tell you, on the most absolute authority, that the sign said simply "Fossil Invertebrates, Temporary Exhibit." You could not improve on that.

The whole museum staff was forthwith, and for days, subjected to such an inquisition as has not been known since Torquemada. There is no doubt that the Hon. Gentlemen were furious with an intensity of fury that even a communist dictator ~~Mr. K~~ could not match. Under pressure the staff developed onto one of the most loyal tight-lipped bodies of men and women ever known. Collective punishment was suggested, but found not in keeping with the dignity of the House, what was left, that is, the vindictiveness manifested, the resentment that no victim could be found, were such that the museum staff 25 years later did not permit themselves to be free from the danger of persecution, and carried the details of the story to the grave with them. Right now, I don't think anyone alive knows who did it.

When you are with friends however, you can figure out a few things. I can say that the placing of the sign was no accident. It was produced during the hustle and bustle, which incidentally people enjoyed, and was seen by many but the final perpetration involved not more than three, possibly only one. Wintemberg was not the kind of man to do it, but he was the ideal provocateur, to set the deed in such a light that the final perpetrator could not resist it. It is like someone once said, of a famous cartoonist who did a naughty cartoon ~~set an indecent but very hilarious double meaning in a cartoon in~~

~~Punch in such a way that you didn't see it until it was pointed out, and then it hit you like a thunderbolt~~ to think of such a thing is to do it. Winty was one of the few who knew.

So much for that. Because ~~emphasis~~ publicity ~~has~~ more recently has been directed towards ~~divis~~ [division?] friction in the Museum, it is interesting to reflect on an occasion when the staff were really united.

When I was with Winty talk was on fieldwork and sites. Here again, a small collection from Cape Breton, or information from Manitoba, or the Yukon, or the western Parks, or the Arctic, was quickly passed on to Dr. Leechman or anyone else. Winty was interested in southern Ontario. In the old reports you can find site lists from his home area, and any place he ever visited looked just like the map of Blenheim township up and down Horner's creek. I know he felt sure that all Canada was something like that—we think so too—and he knew that even Blenheim township was more than a one-man job. At one stage he was concerned with Essex County, where I started school and in which my family once had a summer cottage. The sites I told him about he visited, though at the time he might seem uninterested. Some of them were very choice, and he never missed a good bet where he was working.

He spent a number of summers in the field in areas he picked deliberately because they were blanks in his site catalogue. How can you plan a dig when you are not even sure there is a site? Of course he never went to an area that was originally wetland. Given dry land and natural drainage he didn't believe there was an area without sites. He told me that ~~the longest time he took before~~ he could count on starting to work in a blank area in a day and a half. Once, as he was interested in such an area, in his old car, he found saw what he considered propitious conditions from a great distance. Arrived, he saw a huge ash bed even as he opened the car door, and was at work almost immediately, the farmer being close at hand. His criteria I shall not enlarge on. Most of you could do the same, but I certainly got into a pattern of thinking that has helped me find sites since then. I do not remember any such procedure in connection with his "classical sites."

I have several times emphasized his frailness and yet he has a tremendous record of physical works. I admit the two things are inconsistent. I believe he knew his own limitations and lived accordingly, but he was infinitely patient and infinitely persistent. I suggest also that when he took off in his old flivver for field work in his native and beloved south-western Ontario he experienced a sense of well-being that kept his physical performance abnormally high. In other areas it may have been different. I recall vaguely suggestions that at Tadoussac and in Newfoundland he did not get as much done as had been hoped, for reasons of health, and this in spite of noteworthy discoveries there.

Winty became an archaeologist in his home area, but he was also a historian of its families and folk-lore. Whether history led him to prehistory or vice versa I do not know. His home was in the heart of the "Pennsylvania Dutch" section of Ontario and he was part of this tradition by Germanic blood and language and though his family belonged to the immense Alsatian immigration in the area, emotionally he belonged to the U.E.L. original settlers. Our school books don't tell us, nor does MacLean's magazine, though books like the Trail of the Black Walnut do—that more than half of the original U.E.L. settlers in Ontario were disbanded Loyalist riflemen from the regiments of the German-speaking area of the "Indian Frontier"—that in the first little party of six families who started the Loyalist migration and arrived at Niagara just at Christmas of 1776, there was not one of the so-called Anglo-Saxons. (Young, Buck, Nelles, Bonner, Secord, Bowman) British—yes—but if we had depended on Anglo-Saxons to establish British traditions in Canada they would never have been established. Winty was one of the most British loyalists it has ever been my privilege

to know, but the minute anyone started the Anglo-Saxon routine ~~he was likely to hear Winty's wheeze, was likely to become a shrill and scornful tone which only Winty's caved in chest and vocal chords could produce~~ you could hear his wheezy breathing building up to utterance.

The Pennsylvania Dutch were, of course, especially numerous in the Niagara area, and after the Revolution they were joined by more of their kind, including various religious groups, and expanded until a great Germanic belt extended to Georgian Bay. Other immigrants direct from ~~Germany~~ Europe came, but in the south and centre of this belt the strange old speech mixture of Swabian and English that was already established in Pennsylvania in Revolutionary days persisted and absorbed the dialects [of] the newcomers who merely fortified its traditions.

Winty was interested in anything that had to do with these people, from their story of their arrival in Pennsylvania or Ontario if they came directly, and the records of their Revolutionary war service, to the ultimate development of land use in the new Canada. He realized the ephemeral nature of their language, and recorded every verse, every song, jingle and story he remembered or heard, from a long-winded poem about a country bumpkin going to town (I have heard, I can only remember how sinfully the town slickers flaunted their smoking—*Sie blowsa schmok aus ihra Nase/ Recht an die middle uf die strase*…after all I was merely a neighbour) to translations of English hymns like *"Jesus liebt mich gang gewiss Weil dos in der Bibel iso."* [Jesus loves me for sure because the Bible says so].

Somewhere some of that stuff is published. What became of the notes I know not.

Another thing Winty did was to make a fabulous collection of lighting equipment. It started long before he came to Ottawa, with Dutch candle moulds and candle lanterns, but spread all over the world—we know he added to it while helping Wm. Boyle [David Boyle] at the St. Louis fair, and ended with a really unique collection of various stages in the development of the electric light bulb. For several years after his death it was on display "For Sale" ~~but again I cannot say what happened~~. Douglas Leechman looked after it. Years later I was delighted to see it intact in the Carnegie Museum. Leechman also most generously brought to publication two papers which Winty had pretty well brought to completion, but I know that he worked for all (?) years, I know that he worked on things that were never published.

After I left the museum I saw him less often, but know that he was more often ill. At the time of the collapse of Europe in May 1940, we had a period of dismal weather in Ottawa, in keeping with the news. While walking back from Ottawa south to my residence ~~near the canal~~ beside Brown's Inlet, I encountered Winty at the end of the Bank Street Bridge, near Southminster Church. He looked extraordinarily ~~tall and gaunt~~, and frail, with his scarf and overcoat blowing in the wind of one of the blusteriest spots in Ottawa. I did not want to hold him there, because I had had recent news of his poor health, but he wanted to talk about the war. Bear in mind what I told you, that in his caved-in chest there beat the heart of a Pennsylvania Dutch loyalist rifleman. What he said was quite shrill, and insistent and quite incoherent. His last words as we separated were a wavering "It will come out all right in the end! You'll see." A few days later I heard that he had been taken off to Brockville temporarily, I think, and a year later, more or less, I heard that he had died. This is the man behind the famous reports, when you see his work you can think as you please either of the shy self-taught man among the learned doctors or of the released and brilliant man of the long, back narrow office and the museum sub basement. He could sum his own intellectual and artistic standards in a Pa. Dutch proverb he learned from the "Dutch" loyalist settlement *Shee giecke is net schee, awer schee der is schee*—or

> appearances are no good—it is the true quality of the man or of the work that counts.

These notes shed light on Wintemberg's health and physical appearance, his loyalist Pennsylvania Dutch[1] roots, his approach to field work, his presence in the museum, his lighting collection, his museum work experiences, and his academic insecurities.

At birth, he was not expected to survive (Swayze 1960:143). Clarke describes him as gaunt, thin, and frail, susceptible to common illnesses, such as colds and flus, with a pronounced caved-in chest and a wheezy, high-pitched voice. The year 1935 was challenging for Wintemberg. He was 59 and had just recovered his health after a series of heart attacks, which for five years had prevented him from going into the field. He was only allowed back in the field in June of 1935 to excavate the Southwold site, with the hired assistance of Wilfrid Jury (MOA: Jury; Kapches 2020). Jury described him as sickly, confined to his tent or a special chair near the camp, not capable of working on the site. The description of him at birth and later in life, with the caved-in chest, makes me wonder if perhaps Wintemberg had a congenital condition at birth, as well as a heart condition, that limited his growth and physical development. It seems that Wintemberg pushed himself despite his health. However, Clarke felt that Wintemberg knew his limits and was both "patient" and "persistent" in achieving the research goals he set for himself.

Clarke noted that in Wintemberg's office, Douglas Leechman discovered papers that were ready to be submitted for publication. Accordingly, he sent two papers to *American Antiquity* (Wintemberg 1942, 1946) and Diamond Jenness forwarded another (Wintemberg 1943). The period 1930–1935, when Wintemberg was not allowed to go into the field, provided him with time to write up his research on pottery distribution, the Sidey-Mackey site (1927), and his Tadoussac work (1927–1930). Collecting and publishing folklore was also important to Wintemberg: "it was…more or less a hobby, rather than a profession" (Leechman 1950:252). This aspect of his life was little known by Clarke, who wondered what had become of the notes. Leechman (1950), in fact, compiled his study of Waterloo folklore, which was published by the National Museum posthumously (Wintemberg 1950). Leechman (1950:252) said about Wintemberg, tongue in cheek: "He was never a prolific author and from his first paper in 1899… we have a total of less than 75 contributions (to the *Journal of American Folklore*). The work he did produce was always sound and always worth publication."

Unsurprisingly for someone who collected folklore, Wintemberg loved stories and story-telling. Clarke's talk included stories that showed WJW's dry sense of humor, the account of the parliament's relocation after the fire in particular. Hansard (3 February 1916) recounts that at 9 p.m. the door keeper came into the chamber, as the House of Commons was sitting, shouting "There is a big fire…everybody get out quickly" (House of Commons Debates, 12th Parliament, 6th session, Vol.1, p. 587). The next day, the House resumed sitting at 3 p.m. at the Victoria Memorial Museum. WJW's story of the hustle by museum staff working all night to clear out galleries and offices for the House and Senate is acknowledged in Hansard:

> The Geological Department…have had to be turned out…all of their work for a great many years in arranging their specimens and getting everything ready for the benefit of the public has been, from their point of view, practically thrown away; there was no question of dissent or murmur on their part…(Senate Debates, 12th Parliament, 6th Session, Vol. 1, p. 50).

Thanks to Clarke's speaking notes, we now know that this account in Hansard omitted a detail.

The scandalous sign that had appeared on a stand by the door of the temporary Senate chambers showed WJW's touch as "provocateur." The staff of the museum were united and tight-lipped, protecting one of their own from

[1] This term refers to descendants of early German, rather than Dutch, settlers in Pennsylvania.

administrative punishment. Clarke reflected that this cohesiveness in 1916 contrasted with the dissension at the Museum in the 1960s. This period of friction refers, amongst other Museum matters, to the Richard S. MacNeish and Thomas E. Lee *contretemps* that had consumed Canadian archaeology, starting with Lee's resignation from the National Museum on March 4, 1959. Lee said "he was not prepared to serve under Dr. MacNeish whose professional competence he was not prepared to accept" (House of Commons, 24th Parliament, 2nd Session, Vol. 4, p. 4701, June 12, 1959). MacNeish briefly discusses this in his memoir of his time in Canada at the National Museum (1998), dryly observing that he got his CV published in Hansard. The opportunity to found the Archaeology Department at the University of Calgary led to his departure from Ottawa.

Clarke was interested in archaeology before meeting WJW. He discusses sites in Essex county, which is where his family was from and where they had their summer cottage. Seeking WJW's acquaintance would have been natural for a biologist interested in aboriginal history. His description of WJW's office, with its long, high work table laden with pottery and illustrations of potsherds, which appear in his publications, and his desk piled with reports waiting to be read, gives an impression of his life in the museum. They discussed how to find sites and how WJW chose areas for research. When Clarke knew him, he was in declining health, which did not stop him conducting excavations and survey. Surveys that he had done as a youth by bicycle in the 1890s and early 1900s were now, in the 1930s done by car, from his "flivver" (a cheap car in bad condition). He evaluated site potential from the car window, taking into account the landscape. Permission from farmers was obtained easily, probably due to his personable and modest nature. This information was absorbed by Clarke, who used the same approach to find sites. Clarke observed that WJW's work in southwestern Ontario, his ancestral home, was an elixir for him, a restorative experience. At the time, WJW was excavating the Southwold (1935), St. Ignace (1937–1938), and the W. Ray Newman (1939) sites. The photograph taken by Wilfrid Jury at the Southwold site shows WJW from the side—he did not like to be photographed (Figure 2).

Wintemberg was self-taught and felt insecure because of his lack of formal education. At the Dominion Museum, his colleagues had PhDs, and he felt academically inferior. However, he was aware of these shortcomings and asked for editorial assistance when necessary. He wrote Boyle (Royal Ontario Museum, Library and Archives, Toronto [ROM], David Boyle Correspondence [Boyle], 22 November 1901): "I might say that if any awkward German idiom crept in somewhere in my notes, you could oblige me by correcting the same." But, WJW not only spoke German, it seems likely he was also trilingual. In a letter to WJW, the collector Rutherford Smith (21 April 1939, CMH:WJW) states "I certainly do envy your ability to read Canadian history in the French."

Clarke talks about WJW's collection of light fixtures, one that had been begun long before he came to Ottawa. We know that WJW was at the Pan-American Exposition in Buffalo in 1901 (ROM: Boyle, 6 October 1901) and the St. Louis World Fair in 1904. Clarke notes that WJW's collection was for sale after his death and that he, Clarke, had learned, with relief, that it was now in the Carnegie Museum. Unfortunately, WJW's collection is not in the Carnegie Museums today (Elizabeth Tufts Brown, personal communication March 26, 2020; Deborah G. Harding, personal communication March 26, 2020), nor is it listed in the catalogue of the Canadian Museum of History (Sarah McFarlane, personal communication April 7, 2020). But there is an interesting possible association with the late palaeontologist and material culture historian Dr. Loris S. Russell.

Russell worked at the Geological Survey of Canada from 1930 to 1937. He was also interested in Canadian Folklore and was the author of "A Heritage of Light" (1968), which examines the history of lighting in Ontario, drawing from his own large collection. This could just be a coincidence, but considering WJW's impact on Clarke, could Russell, too, have found friendship with WJW, leading to Russell's

developing an interest in two of WJW's personal pursuits? Russell left the GSC in 1937 to work at the Royal Ontario Museum of Palaeontology. In an article in the *Globe and Mail* of 13 January, 1969, Kay Kritzwiser discusses Russell's interest in early lighting and an exhibit at the ROM highlighting his collection, which is now at the ROM (Carol Baum, personal communication March 27, 2020). In the *Globe* article, she says: "It's his second collection. He started his first in 1958 for the National Museum of Canada when he was National History branch director and acting director for Human History branch. That collection covered objects from the general way of life of Canadian Pioneers." The Russell collection at the Canadian Museum of History is extensive (Stacey Girling-Christie, personal communication April 7, 2020; Sarah McFarlane, personal communication April 7, 2020). Was WJW's collection the basis for it?

Clarke's notes give the impression of an intelligent, artistic, and dryly humorous man, one genuinely liked by his colleagues. This portrait of Wintemberg adds immeasurably to our understanding of him as an archaeologist and as a person. I think it is telling that both Jenness (1941), in the obituary he wrote, and Clarke end with the same adage. Clarke gives us the German phrase and Jenness, in English, the following: "His life's motto was work, work not for material things, for he never valued money or the ordinary things that money will buy, but work to extend man's knowledge and to reveal something of the beauty and truth of life." One can see why W. J. Wintemberg is a legendary giant of Canadian archaeology.

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References Cited

Clarke, C. H. D.
1956 Algonquin Park. In *New Pages of Prehistory: Archaeological Research in Ontario 1956,* edited by J. N. Emerson, p. 11. Reprinted from *Ontario History* 48(4), 1956. Ontario Archaeological Society, Toronto.
1957 Algonquin Park. In *New Pages of Prehistory: Archaeological Research in Ontario 1957,* edited by J. N. Emerson, p. 20. Reprinted from *Ontario History* L(1), 1958. Ontario Archaeological Society, Toronto.

Jenness, D.
1941 William John Wintemberg 1876–1941. *American Antiquity* 7(1):64–66.

Kapches, M. B.
2020 Canadians and the Founding of the Society for American Archaeology (1934–1940s). *Canadian Journal of Archaeology*, in press.

Leechman, D.
1950 Review of Folklore of Waterloo County, by W.J. Wintemberg. *Journal of American Folklore* 63(248):251–252.

Mackie, Q.
1995 Prehistory in a Multicultural State" A Commentary on the Development of Canadian Archaeology. In *Theory in Archaeology: A World Perspective,* edited by P. J. Ucko, pp. 175–193. Routledge, London.

MacNeish, R. S.
1998 My Life in Canadian Archaeology. In *Bringing Back the Past: Historical Perspectives on Canadian Archaeology*, edited by P. J. Smith and D. Mitchell, pp. 61–76. Mercury Series Paper No. 158. Archaeological Survey of Canada, Canadian Museum of Civilization, Gatineau, Québec.

Noble, W. C.
1972 One Hundred and Twenty-Five Years of Canadian Archaeology. *Bulletin* [newsletter of the Canadian Archaeological Association] 4:1–78.

Norment, C.
1988 C.H.D. Clarke (1909–1981). *Arctic* 41(3):256–257.

Pendergast, J. F.
1999 The Ottawa River Algonquin Bands in a St. Lawrence Iroquoian Context. *Canadian Journal of Archaeology* 23(1–2):63–136.

Reaman, G. E.
1957 *The Trail of the Black Walnut.* McClelland & Stewart, Toronto.

Ridley, F.
1958 The Boys and Barrie Sites. *Ontario Archaeology* 4:18–42.

Russell, L. S.
1968 *A Heritage of Light*. University of Toronto Press, Toronto.

Soucy, L.
1962 Report of the April Meeting, OAS. *Arch Notes* [newsletter of the Ontario Archaeological Society] 1962(2):3.

Swayze, N.
1960 *The Man Hunters: Jenness, Barbeau, Wintemberg.* Clarke, Irwin & Company, Toronto.

Trigger, B. G.
1978 William J. Wintemberg: Iroquoian Archaeologist. In *Essays in Northeastern Anthropology in Memory of Marian E. White*, edited by W. E. Engelbrecht and D. K. Grayson, pp. 5–21. Occasional Papers in Northeastern Anthropology, No. 5. Man in the Northeast, Rindge, NH.

Wintemberg, W. J.
1907 Alsatian Witch Stories. *The Journal of American Folklore* 20(78):213–215.
1942 The Geographical Distribution of Pottery in Canada. *American Antiquity* 8(2):129–141.
1943 Artifacts from Ancient Workshop Sites Near Tadoussac, Saguenay County, Quebec. *American Antiquity* 8(4):313–340.
1946 The Sidey-Mackay Village Site. *American Antiquity* 11(3):154–182.
1950 *Folk-Lore of Waterloo County, Ontario.* Bulletin No. 16. National Museum of Canada, Ottawa.

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Profile

Edward Merle Franklin (1915–2008)

Christopher Ellis and D. Brian Deller

Edward Merle Franklin (Figure 1) was a long-time non-professional (avocational) archaeology enthusiast from Dunnville, Ontario, who documented in detail 74 pre-contact sites over the course of more than 70 years. He was one of hundreds of such individuals who have long collected off indigenous sites in the area and elsewhere. This activity and its effects are a fact of life when professional archaeologists confront the archaeological record that exists today (Shott and Pitblado 2015). From the perspective of a modern professional archaeologist, such enthusiasts are seen both as a "benefit" and as a "burden" (Fisher et al. 2015). An account of Franklin's approach and collecting life highlights the benefits. For example, the data he recorded have ultimately saved knowledge that would have been lost, as many of the sites he documented are now destroyed. Moreover, when we reviewed his accounts, it became clear to us that his site-recording was equal to and often better than that of many professional archaeologists working during the same period. Despite the extent and quality of his documentation, however, he made little provision, unfortunately, for preserving that knowledge upon his passing.

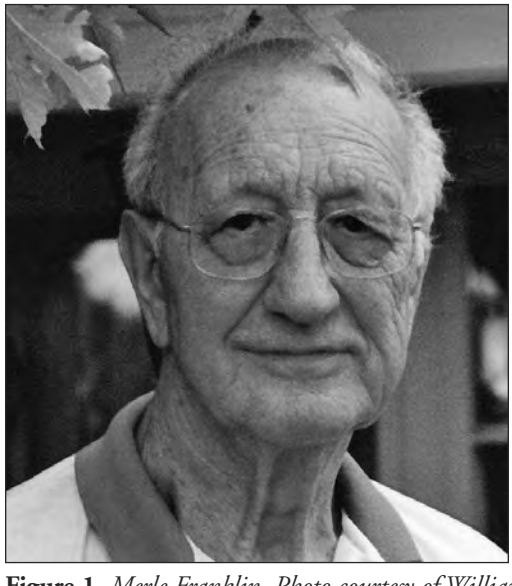


Figure 1. *Merle Franklin. Photo courtesy of William C. Reeve.*

Merle (a designation he preferred) Franklin was born on April 15, 1915, in Furry Tavern, a Heritage Haldimand Designated Property (built 1821) in the hamlet of Lowbanks, just southeast of Dunnville (Reeve 2017a). In 1938, he married Dorothy "Dot" Flatt, solemnizing a union that would last for more than 60 years and result in four children: David, Martha, Andrew, and Jane. Before World War II, he found employment with a fishnet manufacturer. After war service in the RCAF in the Dunnville and Kingston areas, he worked in a factory making automobile supplies. Eventually, he became a custodian for the local school board. Merle Franklin died on August 22, 2008.

When he was 9 or 10 years old, in 1924 or 1925 (Ens 1970; Franklin n.d.), an aunt who had moved to Saskatchewan sent him some stone "arrowheads" she had found. The intrigued Franklin, wondering whether comparable items could be obtained or acquired in his own

neighbourhood, began scouring local fields along the lower Grand River and collecting artifacts. His main focus was indigenous artifacts. Although he came across early Euro-Canadian finds and, based on his archaeology notes (Franklin n.d.), researched in detail related local sites and events of that time, he stated that: "historic material doesn't appeal to me that much" (Franklin 1993a).

For many years, Franklin was almost strictly a relic collector. A major shift in his approach occurred in 1939. It was in that year that he met William J. Wintemberg (1876–1941) and Peter Marshall Pringle (1878–1953). Wintemberg was an archaeologist at the National Museum of Canada in Ottawa (Kapches 2019a, 2019b; Trigger 1978). Indeed, in the late 1930s, he was one of only three professional archaeologists focused on Canada's pre-contact record (Kapches 2020). Pringle was an important and early local and pre-contact history enthusiast in the Dunnville area, who began collecting around 1893 or 1894 (Franklin n.d.; Pringle 1943). Among other things, he was a talented illustrator and cartographer. Pringle had collected from and documented many site locations in the middle to lower Grand River valley vicinity. He produced elaborate, coloured maps showing those locations, along with detailed drawings of their artifacts (see Kapches 2020; Reeve 2002:143–171).[1] He corresponded with prominent archaeologists of the time, such as William A. Ritchie in New York state and William C. McKern in Wisconsin, and had tried for many years to get professional archaeologists interested in the area (Reeve 2002:157–162). He eventually succeeded in convincing Wintemberg to come to Dunnville and carry out excavations in one area at the W. Ray Newman site, which included Early Archaic, Middle Woodland, and Princess Point components.[2] During the 1939 excavations, he first met Franklin (n.d.; Pringle 1941a:270). Wintemberg encouraged Franklin to take a more academic and scholarly approach to his collecting, stressing that he needed to record the location, or provenance, of all his finds, something that Franklin had not done up until that point. He thought so highly of Franklin's abilities that he nominated Franklin for membership in the fledgling Society for American Archaeology (founded in 1935). Others, including William Ritchie (Pringle 1941b), supported his nomination. Franklin joined, but he soon stopped being a member over confusion about payments (Kapches 2020).

Pringle examined Franklin's collection, helping label and record the location of his artifact finds, but he also encouraged him to write up associated information. In Franklin's (1939a:6) own words to Pringle: "Since you gave me a different attitude toward 'collecting' I've had more enjoyment out of it than I had ever had before." The two became fast friends and had shared interests beyond pre-contact indigenous peoples and their history. Of particular note here were fishing and hunting and, derivatively, duck decoys and their carving. The wooden blocks made by both men are now highly prized by collectors (see Reeve 2001, 2002, 2017a, 2017b). They spent autumn afternoons walking fields searching for artifacts, reserving their mornings for duck hunting (Reeve 2017a:46). Pringle clearly saw the younger Franklin as his successor and heir in terms of documenting, protecting, and promoting the archaeological knowledge of the Dunnville area (Pringle 1940a:1).

[1] These original maps, which are true works of art, as well as Pringle's collections, are housed at the Royal Ontario Museum in Toronto. Franklin had photocopies of these maps, which are now kept with his extant records.

[2] This was the last significant excavation of Wintemberg's career, as he died soon after, in 1941, and the results have never been published. The Newman artifacts are still at the National Museum (now Canadian Museum of History). According to Wright (1978:60), the excavation notes have been lost. However, Franklin (n.d.) notes that Dr. Douglas Leechman of that museum told Peter Pringle in 1941 that 1614 artifacts were recovered but that Wintemberg's handwriting in his field notes was so bad that it could not be deciphered "so no report was written." Finlayson (1977:3) says the records were actually destroyed.

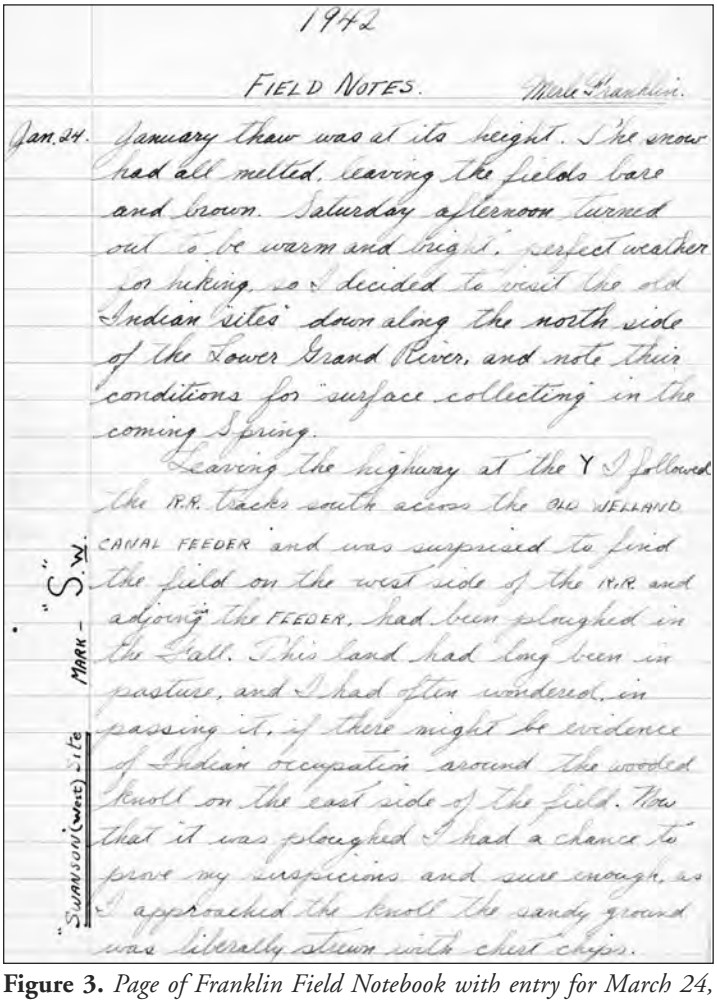
Thanks to the efforts of Pringle and Wintemberg, Franklin developed a more academic approach. He had long appreciated artifacts for their embodied skill, beauty, and innate sense of mystery. But now, rather than being strictly a relic collector, primarily focused on the aesthetics, or possession, of the artifacts, he was becoming interested in the past of the indigenous peoples themselves, their heritage and the meaning of the artifacts. Franklin (1940c:2) peppered Pringle with questions, such as: Why do some stone points have rubbed bases? Why do certain notched end scrapers/bunts have straighter bits? Why does a specific site have huge amounts of material? And what were the ultimate origins/relationships of the indigenous groups known post-contact; and how were they connected to different archaeological developments? He came to recognize that to maximize archaeological information about past peoples and attempt to answer such questions, he needed to know "the cultural context in which it [an artifact] was found…" (Keron 1979:5). This feature is a distinguishing one of the amateur, or avocational, archaeologist as opposed to the simple collector.

Eventually, Franklin amassed a large collection of artifacts that included 29,271 individually catalogued lithic items as well as less specifically catalogued materials, such as some of his net-sinkers, pottery fragments, and flaking debris. He obtained some items in his collection from other collectors, notably from known Neutral (Attawandaron) sites to the north, nearer Brantford, such as Daniels and Seeley/Sealey (see Lennox and Fitzgerald 1990: Table 13.1). The present whereabouts of that Neutral material is unknown (see below). Franklin stored his collection on homemade wooden trays, many placed in a special wooden box, which eventually filled a closet and attic area in his home. Although he recorded the material by site, most of the collection was stored, sorted, or displayed by different artifact types or forms (e.g., Figure 2).

As mentioned above, the overall collection came from 74 pre-contact sites. At least 17 of these locations have been recorded in Ministry records and assigned Borden numbers (William

Figure 2. *Homemade wooden tray holding Franklin Collection artifacts. Note that the collection was sorted by artifact type or class, in this case ovate biface preforms.*

Fox, personal communication April 2020). Examples include such sites as W. Ray Newman (AfGv-3), Klingender (sometimes also called Klingander; AfGv-53), and Armour's Point (AfGv-1), which, among other things, are all major Middle Woodland and/or Princess Point components (Finlayson 1977:3; Stothers 1977:27–28; Wright 1967:119). Many of the sites he documented have been wholly or partially destroyed by subsequent developments or gleaned by numerous other collectors who did not record information on their finds. If it were not for the data recorded by Franklin, our knowledge of them would be very restricted or totally lost. Also, as Franklin and Pringle witnessed (e.g., Franklin 1940c:5; Reeve 2002:162), natural erosion along Lake Erie and the Grand River's banks was destroying sites during their lifetimes. As well, continued cultivation of sites over a long period (and, we might add, with increasingly more powerful machinery) resulted in severe damage to the artifacts themselves (Franklin n.d.). Early on, both Franklin and Pringle were worried about continued site destruction by development activities and natural processes. For example, they discussed how an airport planned for the area during the early war years might destroy several sites (Franklin 1939b:5, 1940a:1, 1940b). They also obtained and recorded collections from several local farmers who had gathered artifacts while working fields. As modern archaeologists are well aware, such "incidental" farm collections are almost always dispersed among the landowners' heirs, so that specific locational information, more often than not, becomes lost or vague. Overall, Franklin and Pringle regarded their work as salvaging important information they thought would be destroyed. With few or no professional archaeologists available, and certainly no cultural resource management (CRM) practitioners available, concerned avocational archaeologists of the time had to fulfill that role.


1942

FIELD NOTES. Marie Franklin.

Jan. 24. January thaw was at its height. The snow had all melted, leaving the fields bare and brown. Saturday afternoon turned out to be warm and bright, perfect weather for hiking, so I decided to visit the old Indian sites down along the north side of the Lower Grand River, and note their conditions for surface collecting in the coming Spring.

Leaving the highway at the Y I followed the R.R. tracks south across the OLD WELLAND CANAL FEEDER and was surprised to find the field on the west side of the R.R. and adjoining the FEEDER, had been ploughed in the Fall. This land had long been in pasture, and I had often wondered, in passing it, if there might be evidence of Indian occupation around the wooded knoll on the east side of the field. Now that it was ploughed I had a chance to prove my suspicions and sure enough, as I approached the knoll the sandy ground was literally strewn with chert chips.

"Swanson (West) Site" Mark – "S.W."

Figure 3. *Page of Franklin Field Notebook with entry for March 24, 1942. Discovery of Swanson West site is described. Details such as this, along with maps by Peter Pringle, provide precise locational data for the site.*

In the accompanying records, site locations are referenced primarily by at least a legal lot and concession number or street address. Many can be located more precisely on the detailed maps of Peter Pringle. In fact, for accuracy's sake Pringle would consult with Franklin, which included sending him some of his detailed maps, tracing paper,

and pencils, so that Franklin could record new sites, corrections to existing ones, and topographic details (Franklin 1939a, 1939b). For several sites, there is specific detail about locations in relation to local landmarks and buildings of the time (e.g., Figure 3) and a few sketch maps. For several other larger, very productive sites, such as W. Ray Newman, different areas or concentrations were recognized, sometimes initially by Pringle, but with added input from Franklin (1940a:1). Franklin himself recognized different areas on some larger sites as far back as 1936, so that he could, in retrospect, align them with Pringle's data.

As was standard for the time, with one significant exception to be described below, there was little effort to piece-plot surface materials, whether by avocational or professional archaeologists. For some distinctive items, such as a platform pipe, Franklin used a tape measure to record a location. Franklin (1940a:2) reported such additional data so that Pringle could incorporate it into his records (Pringle 1939; Reeve 2002:150). Regardless, these locational details often went way beyond those of archaeologists at public institutions, as one of us (CJE) learned first-hand. During preparations for a Niagara Peninsula survey in the 1970s (Ellis 1979), CJE remembers requesting from the Ontario government lists of sites assigned Borden numbers in that region. In one of those Borden blocks, one of the first sites designated was recorded by an archaeologist in the early 1960s with the locational data stated as "near St. Catharines, Ontario." There is evidence that Franklin did, on the very rare, perhaps unique occasion, excavate. The evidence includes an extant unit map as well as Princess Point artifacts in the collection, including an almost entire reconstructed pot and other ceramics labelled with one-metre square designations, such as "2SW3," rather than the usual catalogue numbers.

As Franklin did not type, the associated records are all handwritten.[3] He maintained several ledgers ("record books"). In them he listed and described artifact finds from each site, the date on which they had been collected, and their identification numbers, which he wrote on the items themselves in a distinctive black India ink script (Figure 4). His notes indicate that he even researched the best way to label these items. To add to the documentation, we have access to correspondence, such as his 1939–1940 letters to Pringle and a large series of letters he received from Peter Pringle between 1939 and 1950. Also preserved is a series of letters dated from March 1992 to September 2006 that he wrote to a friend and fellow duck-decoy enthusiast, Jim Kearns of Calgary (see Reeve 2017a), discussing

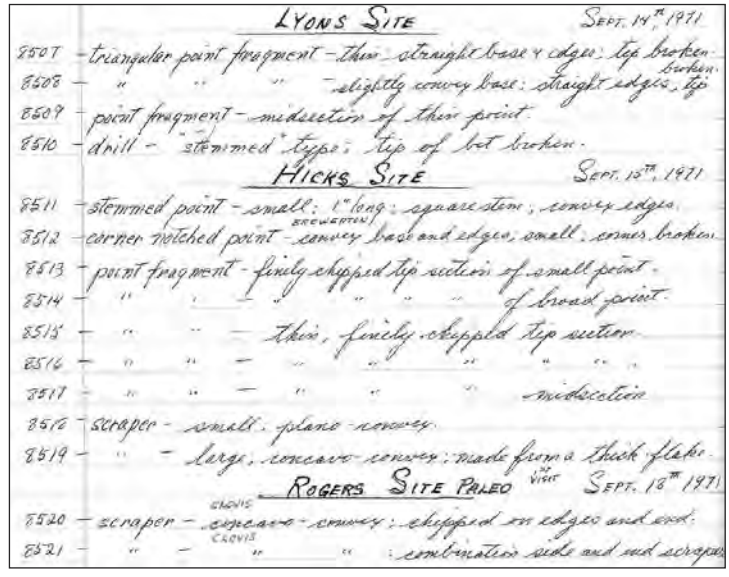

LYONS SITE Sept. 14th, 1971
8507 – triangular point fragment – thin, straight base & edges; tip broken
8508 – " " " – slightly convex base; straight edges, tip broken.
8509 – point fragment – midsection of thin point.
8510 – drill – stemmed type; tip of bit broken.
HICKS SITE Sept. 15th, 1971
8511 – stemmed point – small; 1" long; square stem; convex edges. SPECIMEN
8512 – corner notched point – convex base and edges, small; corners broken.
8513 – point fragment – finely chipped tip section of small point.
8514 – " " " " " of broad point.
8515 – " " – thin, finely chipped tip section
8516 – " " – " " " " "
8517 – " " – " " " midsection
8518 – scraper – small, plano convex
8519 – " – large, concave convex; made from a thick flake
ROGERS SITE PALEO 1st visit Sept. 18th 1971
8520 – scraper – CLOVIS concave-convex; chipped on edges and end.
8521 – " – " " CLOVIS; combination side and end scraper

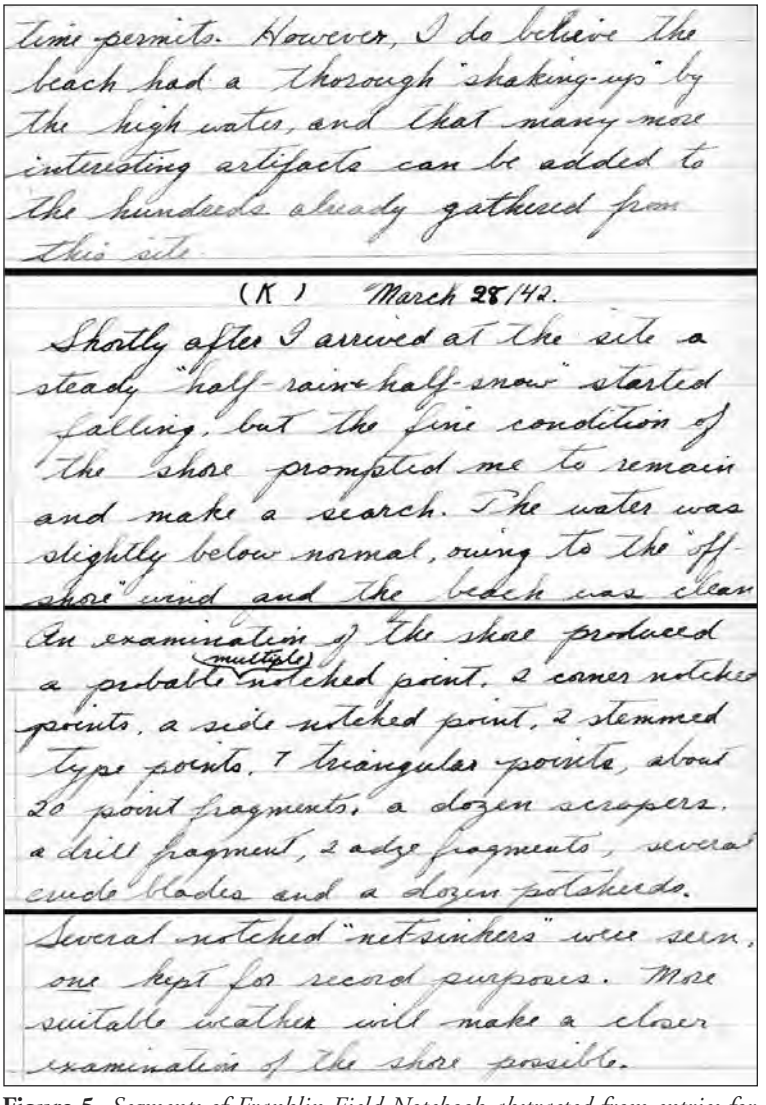
Figure 4. *Section of a page from Franklin Archaeological Ledger/Artifact Record Book. First visit to Rogers site is included, with later annotations stating it is a Paleo and Clovis site.*

[3] We are certain we do not have all of the records Franklin compiled. There are items suggested in surviving correspondence and finds, such as the excavation map, that we have not seen.

archaeological matters (e.g., Franklin 1993a, 1993b).

Additional written records include smaller notebooks that register activities in the late 1930s and early 1940s (Figures 3 and 5). The artifact descriptions, such as those mentioned in Figure 5, can be tied to the actual artifacts via the ledger entries for the same date. Franklin expanded his notes to fill a three-ring notebook entitled simply "archaeology,"[4] which he maintained and continued to add to for many years.

The subject matter of this main notebook includes sites, their locations, interesting artifacts found by landowners, along with the odd artifact sketch and the contents of his archaeology library, listing books he had read and purchased (and where he got them and for how much). It has information about particular sites in the lower Grand River area, often long since destroyed. An example is the Wm. Johnston Mound, which had been "opened up" under the direction of a Dr. George Alexander McCallum. McCallum had a medical practice in Dunnville in the late 1800s and even served for a time in the early 1900s as superintendent of the Asylum for the Insane in London, Ontario. He was one of the first recorded systematic avocational archaeologists in the Dunnville area, and his collection and associated records were later donated to Queen's University in Kingston.[5] Since much of Franklin's work was written before the existence of photocopying, he had also copied out portions of books, ranging from field methods for survey and excavation, to sections from William Ritchie's (1957) *Traces of Early Man in the North-*


time permits. However, I do believe the beach had a thorough "shaking-up" by the high water, and that many more interesting artifacts can be added to the hundreds already gathered from this site.

(K) March 28/42.

Shortly after I arrived at the site a steady "half-rain half-snow" started falling, but the fine condition of the shore prompted me to remain and make a search. The water was slightly below normal, owing to the "off-shore" wind and the beach was clean. An examination of the shore produced a probable (multiple) notched point, 2 corner notched points, a side notched point, 2 stemmed type points, 7 triangular points, about 20 point fragments, a dozen scrapers, a drill fragment, 2 adze fragments, several crude blades and a dozen potsherds.

Several notched "net-sinkers" were seen, one kept for record purposes. More suitable weather will make a closer examination of the shore possible.

Figure 5. *Segments of Franklin Field Notebook abstracted from entries for March 24 and 28, 1942. Discussions concern condition and nature of one area of the Klingender site and its finds.*

[4] The contents of the second half of the book cover duck decoys and their manufacture and collecting.

[5] His collection at Queen's is in the Agnes Etherington Gallery, and the catalogue is in the university's archives (Mima Kapches, personal communication April 2020).

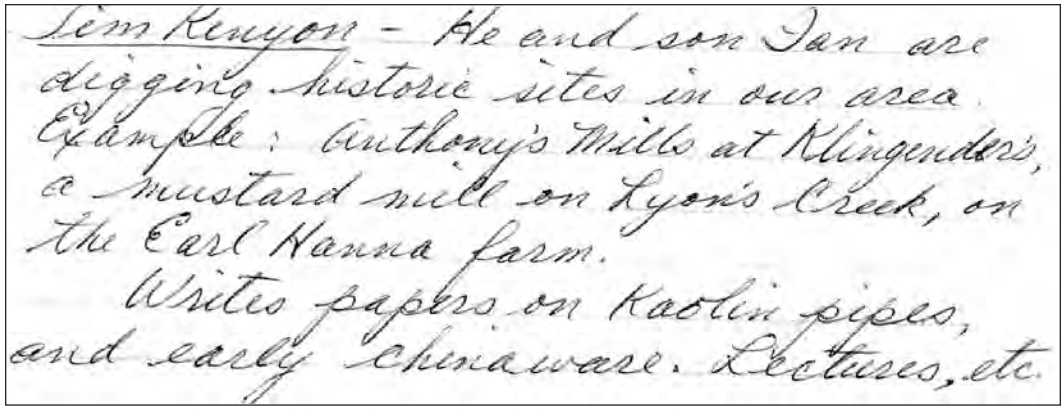

Tim Kenyon – He and son Ian are digging historic sites in our area. Example: Anthony's Mills at Klingenders, a mustard mill on Lyon's Creek, on the Earl Hanna farm.
Writes papers on Kaolin pipes, and early Chinaware. Lectures, etc.

Figure 6. *Extract from Franklin (n.d.) Record Book showing entry for Tim Kenyon.*

east and Donald Crabtree's (1972) *An Introduction to Flintworking*, to information on how to describe and type stone points and other artifact forms and recognize functionally different types of sites. As another example of his thoroughness, we note that on one page of the notebook for the period 1967–1974, he calculated the number of site visits (averaging 67 trips per year) and the months that were best for surface collecting in terms of artifact yield. August was the best month, which we found a bit surprising, until we realized that at that time he probably concentrated on larger sites along Lake Erie and the lower Grand River itself. There, when water levels were lowest, meaning in late summer, artifacts could be more easily gathered in larger numbers than on cultivated surfaces covered by mature crops.

The main notebook also contains a list of individuals he knew, or knew of, who had carried out work and amassed collections from sites primarily in the Grand River and Niagara Peninsula region, but also from farther afield. Among these individuals, some are well known from the literature: Thomas Kenyon (Figure 6), Fritz Knechtel, Ivan Kocsis, George (Bill) Marshall, Charlie Nixon, Ralph Schooley, and Rutherford Smith.[6] The notebook includes individuals who became professional archaeologists, such as Ian Kenyon and Paul Lennox. Franklin encouraged Paul Lennox to pursue a career in the field. Many individuals are less well known. Franklin registered how some of these enthusiasts went beyond surface collection and carried out excavations.

The sheer number of people listed or mentioned (78 in total) and the implied size of many of their collections are impressive. Of course, there are many more recent collectors still active in the area, as implied by Bruechert (2018). Unfortunately, it is likely that, unlike Franklin and

[6] Several of these collections were subsequently donated to institutions. For example, the Marshall Collection, from the Brantford vicinity, and the Schooley Collection, from the Port Colborne area, are housed at the Royal Ontario Museum. The Smith Collection, from the northern part of the Niagara Peninsula and the adjacent Brantford area (see Fox 2013), is housed in the Anthropology Department and Sustainable Archaeology at McMaster University. Nonetheless, more effort is required to accommodate such collections in responsible, more public, institutions. One barrier to hosting these collections is that many institutions require/need funds to process them for long-term storage—a problem not unique to Ontario (e.g., Shott 2018:3). Recognizing this difficulty, the Ontario Archaeological Society has begun establishing the Charlie Garrad Avocational Archaeological Collections Fund to assist in preserving such materials and records for well-recorded assemblages (Anonymous 2019).

Schooley, many collectors do or did not record locational information. In addition, many collections have been traded or sold off, often piece-meal, to the extent that they have been dispersed and separated from any records that may have existed.

The sheer number of collectors listed emphasizes how many sites have suffered from the indiscriminate removal of unrecorded material in this area alone. We will never really know what they were like originally, which is a major problem facing today's archaeologists (see Ellis 2018; Fox 2018).

Since CRM projects often use single-pass surveys on ploughed fields, such surveys would be expected to underestimate the subsurface potential of sites because of the removal of this unrecorded material. Also, as collectors tend to focus on collecting and removing diagnostics, this activity severely limits our ability to recognize the age and cultural affiliations of many sites (Gonzalez-Macqueen and Ellis 2017; Nolan et al. 2018; Shott 2017, 2018). Even comparatively well-documented avocational collections in public institutions, or older academic ones, are often unknown to today's researchers. While there have been initiatives to correct this problem (Dent and Moody 2019), we need a more concerted endeavour to add the older, better-documented collections with site locational information, such as Franklin's, to site databases, such as that maintained by the Ontario government. Indeed, we hope this Profile serves to make people more aware that such collections exist, to provide information on where they are housed, and to encourage efforts to preserve the information they contain.

We know that Franklin corresponded with academic archaeologists Carl Guthe in Michigan (Pringle 1941c:2) and William Ritchie in New York. In June 1940, Franklin and Pringle (Pringle 1940b:2) met Ritchie and his assistant, Charles Wray, at the important site(s) at Port Maitland (see Ritchie 1944:181). Some evidence suggests, however, that Franklin was reluctant in later life to talk to such individuals. In his main notebook, he mentions a case where he feared a certain person would borrow and not return an artifact. One suspects his reluctance stemmed at least partly from this fear. On the other hand, he attended academic symposiums, such as the archaeology symposiums at McMaster University, held and hosted by the undergraduate students for many years in the late 1970s to 1980s. He attended an artifact identification day hosted by Bill Fox and others in the Dunnville area during that same period (Lorenz Bruechert, personal communication April 2020). He also had contact with other professional archaeologists and students. For example, he met with Jacqueline Fisher (personal communication April 2020) in 2001, when her firm was involved in CRM work on a site he had documented. He mentions talking with her and other academics, mainly students, in his own notes (Franklin n.d.). He also made no secret about having an extensive archaeological collection. He gave several newspaper interviews (e.g., Ens 1970), served as an informant for a major work on Peter Pringle that included many archaeological references (Reeves 2002), exhibited parts of his collection many times at various local events (e.g., Franklin 2002, 2003), and gave talks to local heritage organizations (Franklin 1995).

Thanks to the efforts of Brian Deller and his former student Mike Austin, the majority of Franklin's records and collections, but not all (see below), are being incorporated into the collections at the Museum of Ontario Archaeology, in London. While we have not examined most of this collection in great detail, at first glance, it seems typical of many large ones we have seen over the years. That is, it is dominated by materials dating from the late Middle Archaic through to the early Late Woodland. For example, stone points matching Brewerton series types and Early Woodland Meadowood forms are quite common. As expected, Middle Woodland and Princess Point materials are especially well represented. Given the location of the sites on a major river and along the Lake Erie shoreline, one should not be surprised that there are hundreds of notched pebble and cobble net-sinkers, which could present a major problem for an archaeological storage facility. At the opposite extreme, materials dating earlier are comparatively rare, as are specific artifact forms. For instance, there is only one find of a birdstone,

and there are only a handful of Late Paleo Holcombe and Hi-Lo components and Early Archaic Kirk Corner-Notched–cluster sites. We note, though, that Early Archaic Bifurcate Base cluster–related components are more common than is the norm in southern Ontario collections we have examined. In the future, we hope to provide descriptions of several of those early site collections, notably a substantial Hi-Lo site.

Of note, there are no isolated finds of Early Paleo fluted points. There is, however, one Paleo site, called Rogers (Figure 7; Deller et al. 2018; Ellis and Lothrop 2019), which is only the fourth well-documented site location of that period we know of from east of the Grand River valley across the entire Niagara Peninsula. The style of the points recovered at Rogers most closely resembles that of the earliest known forms from western

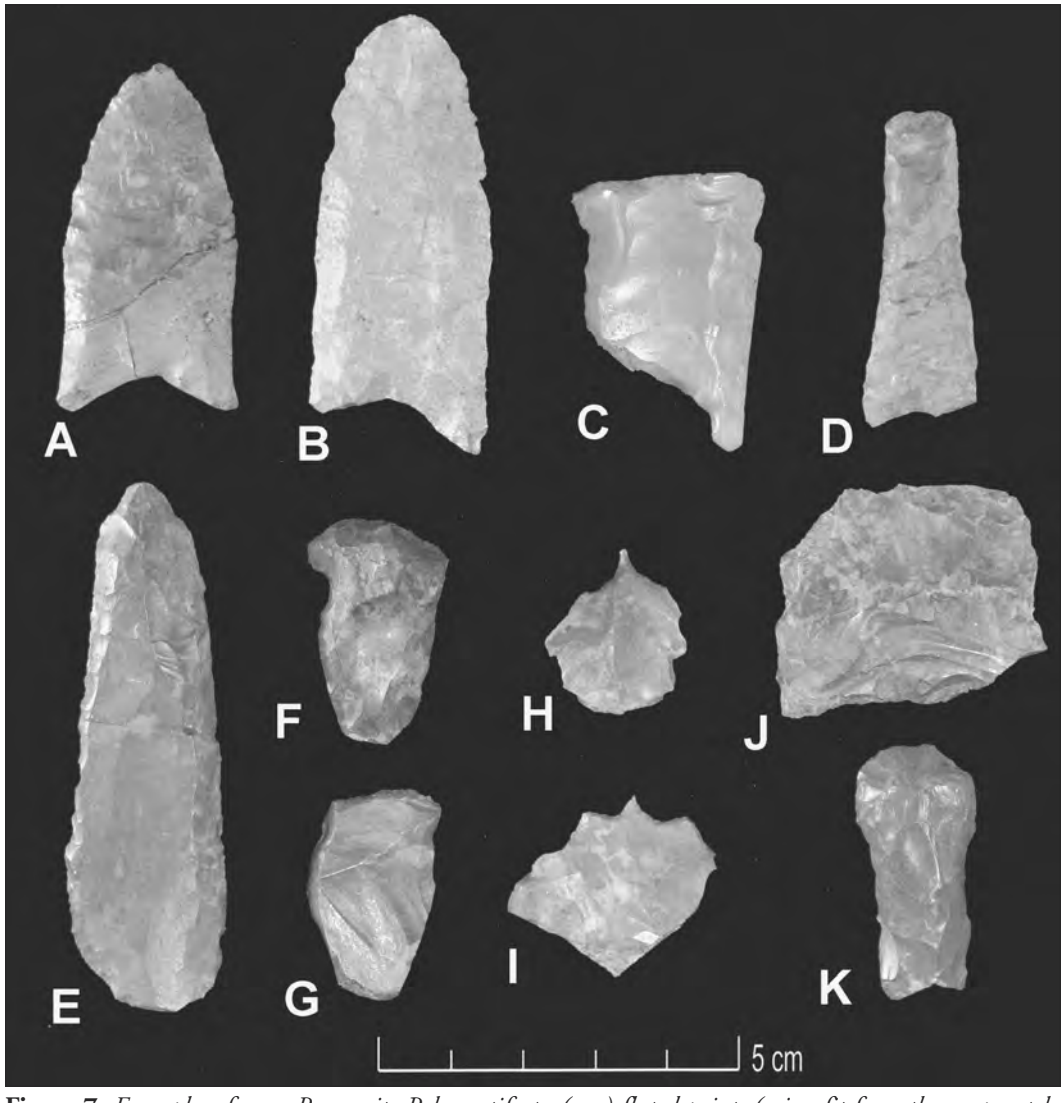


Figure 7. *Examples of some Rogers site Paleo artifacts. (a–c) fluted points (a is refit from three separately surface-collected pieces); (d) fluted twist drill; (e) perforator/enterline scraper; (f, g) trianguloid end scrapers; (h, i) gravers;(j) pièce esquillée; (k) stemmed end scraper. a, d, e, g, h, i, and j are on Onondaga chert; b is on Haldimand chert; c is on Flint Ridge chalcedony; f is on Upper Mercer chert; and k is on Pennsylvania jasper.*

North America. It suggests that Rogers is probably the oldest Ontario site yet discovered. It is the closest to being a "Clovis site" (as Franklin called it) that we have seen. While we are most certainly biased, having spent a great deal of our careers trying to document Paleo sites, we think others will agree that Rogers is a very important location that is worthy of more extended discussion. Its documentation by Franklin is responsible for a substantial increase in our understanding of the earliest history of this area regarding tool kit composition, changing lithic source preferences over time, population movements/interactions, and overall patterns of settlement. Of importance here is the fact that the Rogers sites illustrates the breadth of Franklin's knowledge, his attempts to document the site as thoroughly as possible, and his tenacity.

Franklin (1993a) wrote to Jim Kearns about how he discovered the Rogers site in 1972. It would be more accurate, however, to say he discovered it in 1971 based on his records (Figure 4) but was unaware it was a fluted point site until 1972, when the first point was recovered. He had been collecting since the mid-1920s, so it took him almost 50 years to make such a find, an indication of how rare these sites really are. He had long been interested in early sites, and in the brief summaries in his notes of other collections, he notes, consistently, whether fluted points were present. Franklin was an avid reader of works about ancient sites, such as Ritchie's (1957) *Traces of Early Man in the Northeast,* as well as George MacDonald's (1968) report on the Debert Site, Nova Scotia, and Robert Funk's (1973) report on the West Athens Hill site, New York. As among professional archaeologists, there is often a fixation on finding the oldest (and rarest) sites and artifacts, and Franklin was no exception. As his field records attest, he visited the Rogers site 163 times over a 25-year period, despite the fact it was often in alfalfa or overgrown and not cultivated, conditions which made it impossible to do surface collection for substantial periods. His notes indicate that he even visited the site on Christmas Day when the weather was suitable. There are, in fact, six records of him surface collecting on various sites on Christmas Day.

While he initially collected Rogers without recording the specific location of any find, he came to recognize clear spatial patterning within the site. He began noting the specific artifact concentrations within which particular finds were made, and then, for the most distinctive tools and preforms, he started piece-plotting their locations. Having recourse to descriptions derived from his archaeology field method books, he plotted items in relation to local landmarks, pacing off distances using a compass and his own practised and measured stride of 30 inches. From these plottings, he created a detailed map of the site (Figure 8), which suggests that it had an organized/patterned spatial layout, comparable with that seen at other known Paleo sites (see Deller et al. [2018] for details). In the 1970s, piece-plotting was unusual, even among many professional Ontario archaeologists. Also, when he had previously surface-collected, he had not generally collected flaking debris. Yet he did so here, recording its location by site or site area rather than by piece-plotting. He collected this material seemingly because he wanted to find the distinctive channel flakes removed in projectile point fluting that are often as diagnostic of these occupations as the fluted points themselves. The attempt to recognize these items, and his sorting and recording of the collection by tool type, show that he had an excellent working knowledge of the Paleo literature. For the most part, his sorting matched that of how long-time specialists would have typologically sorted the collection for analytical purposes. We would argue that his knowledge of these materials was better than that of most professional archaeologists who do not specialize in this area. Because the construction of agricultural buildings in the late 1990s destroyed part of the northeastern area, all we are ever going to know about some aspects of this site comes from Franklin's work.

Franklin's interest and genuine attempts to document as much as possible within his means, and to understand the site and the people who used it, are laudable. In the end, however, a primary reason for his work may have been his need to satisfy his own enduring and insatiable curiosity, rather than to contribute to general

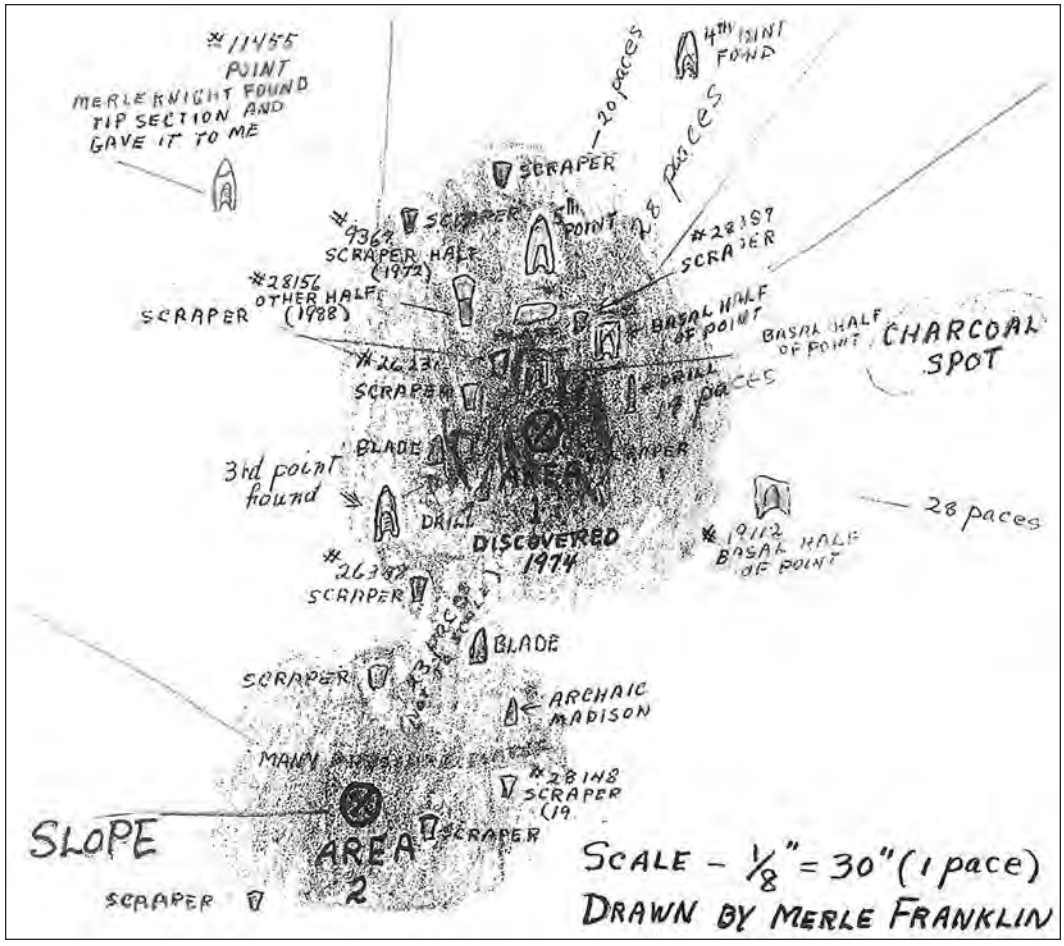


Figure 8. *Detail of section of Merle Franklin map of the Rogers site. Areas 1 and 2, the first ones delineated at the site, are shown on this segment of the map.*

archaeological knowledge. For the most part, Franklin kept the nature of his collections from Rogers a secret from everyone but the late Merle Knight, a fellow enthusiast and former curator at the Haldimand Museum, who also had a small collection from the site (present whereabouts unknown). In 2001, Franklin did mention that he had found a Paleo site to Jacqueline Fisher (personal communication April 2020). When she expressed interest, he stated that it was now completely destroyed, even though this would seem to have been an overstatement.

While he had gone to great lengths to record and preserve information about his entire collection and its context of discovery, in a contradictory way, he made no thorough effort to preserve the knowledge upon his death, an omission that is an all-too-frequent occurrence among artifact collectors. As a result, his collection was broken up among his heirs. Subsequently, some items reached the collector market via auction houses and other sources—but stripped of any associated information. As the collection was stored by artifact type or class, this means that some material from certain sites has been lost or has disappeared. Rogers is a good example of this unfortunate process. While the records indicate that almost 900 tools and preforms or fragments thereof were collected—one of the largest collections from any Ontario fluted point site—

only 699 are in the extant collection. Unfortunately, the missing items are largely trianguloid end scrapers, one of the most informative of Paleo tool types (Ellis and Deller 2020; Lancashire 2001). We would recognize them by Franklin's distinctive numbering if they ever surfaced. At Rogers, so many end scrapers were found that they represent the largest single collection of such items from any of the several known excavated fluted point–related sites in Ontario. Another example is the items he had from the Neutral sites, such as Daniels and Seeley. They were discovered by us in pictures posted on an online auction site, showing the site names written on the artifacts themselves.

We do not know why Merle Franklin did not make more effort to preserve his legacy. Attempts to do so may have been thwarted by him having cancer in his final years. He may have had unpleasant experiences with certain professional archaeologists who did not hold avocational work in high regard. Given his experience with professional archaeology at the W. Ray Newman site, where the work ended up unreported, he may not have trusted museums or other public institutions to preserve his work. Certainly, Pringle (1942:1; see also Reeve 2002:164–165) ended up feeling the same way about the National Museum of Canada, as well as some other museums. Trust between professional archaeologists and avocational archaeologists is not always easy to achieve and maintain (Lovis 2018). Franklin also may have been worried that the *Ontario Heritage Act* legislation, which came into force in the early 1970s, would have adverse legal consequences for his long-term archaeological activities. Perhaps he may have, as a self-taught lay person, underestimated the high regard that professional archaeologists would come to have for his work and the extent to which they would need to consult it. William C. Reeve (personal communication April 2020), who knew Merle very well, characterizes him as a very shy, diffident man with a real modesty, which may have inhibited him developing relationships with recognized professional experts. For example, as his letters to James Kearns corroborate, Franklin was astounded by the demand and values that were being placed on his own duck carvings. Whatever the case, at least a major part of his significant archaeological activities has been preserved. In any future archaeological work in the lower Grand River area and, for that matter, in attempts to understand the earliest known human occupations of the province, as well as those of the Princess Point complex, his work will need to be consulted and acknowledged.

Acknowledgements. We owe many thanks to several individuals who made this Profile possible, beyond, of course, first and foremost, Merle Franklin himself. Mike Austin and Jamie McDougall recognized the significance of the Franklin collection and the existence of field notes and artifact catalogues and brought them to our attention. In addition, Dave Franklin and Martha Franklin-Nie assisted us greatly in discovering and documenting their father's collections. We cannot thank them enough. A special vote of thanks goes to: Graham Deller and Flora MacKellar, who helped get the Franklin artifact records in order; Ed Eastaugh, who assisted in preparing our Rogers site map and took the artifact photo; James Kearns, who provided his correspondence with Merle Franklin, which allowed it to be included with the archaeological records at the Museum of Ontario Archaeology, in London; and to both that museum and the Royal Ontario Museum, in Toronto, for conserving the important and precious data-filled documents concerning Merle Franklin that we have consulted for this paper. William Reeve lent an eye to an earlier draft, and for that, and the photo of Merle he has provided, we are exceptionally grateful. Finally, Lorenz Bruechert, Neal Ferris, Jacqueline Fisher, William Fox, Paul Lennox, and especially Mima Kapches provided essential information that made our writing task and arguments much easier and our account of Merle Franklin's activities more thorough; enlightening; and, we believe, personal.

References Cited

Anonymous

2019 The Charlie Garrad Avocational Archaeological Collections Fund. *Arch Notes* [newsletter of the Ontario Archaeological Society], New Series 24(4):6.

Bruechert, W.L.

2018 Who Is Interested in Archaeology? Building a Trusting Relationship among Landowners and Collectors in Haldimand-Norfolk County, Ontario, Canada. In *Collaborative Engagement: Working with Private Collections and Responsive Collectors*, edited by M.J. Shott, M.F. Seeman, and K.C. Nolan. Midwest Archaeological Conference Occasional Papers No. 3:29-36.

Crabtree, D.

1972 *An Introduction to Flintworking*. Occasional Papers of the Idaho State Museum No. 28(2). Pocatello, Idaho.

Dent, J., and J. Moody

2019 Lead Legacy: Addressing Unregistered Sites in the 21st Century. *Arch Notes*, [newsletter of the Ontario Archaeological Society], New Series 24(2):13–14.

Deller, D. B., C. J. Ellis, and M. Franklin

2018 The Rogers Site: An Early Paleoindian Site in the Niagara Peninsula Region of Ontario. *Archaeology of Eastern North America* 46:103–134.

Ellis, C. J.

1979 Archaeological Survey and Testing in the Niagara Peninsula Region of Ontario, 1977. Report on file, Ontario Ministry of Tourism, Culture and Sport, Toronto.

2018 A Tale of Two Archaeological Collections. *Arch Notes* [newsletter of the Ontario Archaeological Society], New Series 23(2):8–11.

Ellis, C. J., and J. C. Lothrop

2019 Early Fluted-Biface Variation in Glaciated Northeastern North America. *PaleoAmerica* 5:121–131.

Ens, W.

1970 Finds 7000 Indian Relics Along Grand River Banks. *Dunnville Chronicle Newspaper*, May 27:1. Dunnville.

Finlayson, W. A.

1977 *The Saugeen Culture: A Middle Woodland Manifestation in Southwestern Ontario*. Mercury Series Paper No. 61. National Museum of Man, Archaeological Survey of Canada, Ottawa.

Fisher, L. E., S. K. Harris, R. Schreg, and C. Knipper

2015 The Benefits and Burdens of Private Artifact Collections. *The SAA Archaeological Record* 15(5):24–28.

Fox, William

2013 The Old Sites Project: An Update. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 13(1):1–8.

2018 The Old Collections Project (an Uncertain Future). *Arch Notes* [newsletter of the Ontario Archaeological Society], New Series 22(6):5–7.

Franklin, M.

1939a Letter to Peter Pringle of November 27, 1939. On file, Royal Ontario Museum, Toronto.

1939b Letter to Peter Pringle of December 12, 1939. On file, Royal Ontario Museum, Toronto.

1940a Letter to Peter Pringle of January 24, 1940. On file, Royal Ontario Museum, Toronto.

1940b Letter to Peter Pringle of April 12, 1940. On file, Royal Ontario Museum, Toronto.

1940c Letter to Peter Pringle of November 22, 1940. On file, Royal Ontario Museum, Toronto.

1993a Letter to James Kearns of Calgary, February 3, 1993. On file, Museum of Ontario Archaeology, London, Ontario.

1993b Letter to James Kearns of Calgary, December 1, 1993. On file, Museum of Ontario Archaeology, London, Ontario.

1995 Letter to James Kearns of Calgary, October 27, 1995. On file, Museum of Ontario Archaeology, London, Ontario.

2002 Letter to James Kearns of Calgary, June 17, 2002. On file, Museum of Ontario Archaeology, London, Ontario.

2003 Letter to James Kearns of Calgary, July 2, 2003. On file, Museum of Ontario Archaeology, London, Ontario.

n.d. Archaeology & Woodcarving. Notebook on File, Museum of Ontario Archaeology, London, Ontario.

Funk, R. E.
1973 The West Athens Hill Site (Cox 7). In *Aboriginal Settlement Patterns in the Northeast*, edited by W. A. Ritchie and R. E. Funk, pp. 9–36. Memoir No. 20. New York State Museum and Science Service, Albany, New York.

Gonzalez-Macqueen, F., and C. J. Ellis
2017 Re-discovering the Joe DeRyk #1 Site (AeHf-21). *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 17(1–4):28–36.

Kapches, M.
2019a Politics and Dirt: W. J. Wintemberg in Toronto. *Ontario Archaeology* 99: this issue.
2019b C. H. D. Clarke Reminisces about W. J. Wintemberg. *Ontario Archaeology* 99: this issue.
2020 Canadians and the Founding of the Society for American Archaeology (1934–1940s). *Canadian Journal of Archaeology:* forthcoming.

Keron, J.
1979 The Role of the Amateur Archaeologist. *Kewa* [newsletter of the London Chapter, Ontario Archaeological Society] 79(8):5–7.

Lancashire, S.
2001 Early Paleoindian Trianguloid End Scrapers: An Analysis. Unpublished M.A. thesis, Department of Anthropology, University of Western Ontario, London, Ontario.

Lennox, P. A., and W. Fitzgerald
1990 The Culture History and Archaeology of the Neutral Iroquoians. In T*he Archaeology of Southern Ontario to A.D.1650*, edited by Christopher J. Ellis and Neal Ferris, pp. 405–456. Occasional Publication No. 5. London Chapter, Ontario Archaeological Society, London.

Lovis, W. A.
2018 Preserving Michigan's Archaeological Heritage: A Collective Endeavor. In *Collaborative Engagement: Working with Private Collections and Responsive Collectors,* edited by M. J. Shott, M. Seeman, and K. C. Nolan, pp. 21–28. Midwest Archaeological Conference Occasional Papers No. 3.

MacDonald, G. F.
1968 *Debert: A Palaeo-Indian Site in Central Nova Scotia*. Anthropology Papers No. 16. National Museum of Man, Ottawa.

Nolan, K., J. Leak, and C. Quimbach
2018 The Single-Pass Survey and the Collector: A Reasonable Effort in Good Faith? In *Collaborative Engagement: Working with Private Collections and Responsive Collectors*, edited by M. J. Shott, M. Seeman, and K. C. Nolan, pp. 51–66. Midwest Archaeological Conference Occasional Papers No. 3.

Pringle, P. M.
1939 Letter to Merle Franklin of November 14, 1939. On file, Royal Ontario Museum, Toronto.
1940a Letter to Merle Franklin of January 29, 1940. On file, Royal Ontario Museum, Toronto.
1940b Letter to Merle Franklin of August 11, 1940. On file, Royal Ontario Museum, Toronto.
1941a The "Put" and "Take" Proposition. *American Antiquity* 6:266–271.
1941b Letter to Merle Franklin of April 10, 1941. On file, Royal Ontario Museum, Toronto.
1941c Letter to Merle Franklin of June 16, 1941. On file, Royal Ontario Museum, Toronto.
1942 Letter to Merle Franklin of February 15, 1942. On file, Royal Ontario Museum, Toronto.
1943 Letter to Merle Franklin of February 19, 1943. On file, Royal Ontario Museum, Toronto.

Reeve, W. C.
2001 The Pringle Students. *Decoy Magazine* 25(2):12–17.
2002 P*eter M. Pringle: Master Decoy Maker.* McGill-Queens University Press, Montréal, Québec.
2017a Merle Franklin: A Dunnville Treasure. *Canadian Antiques and Vintage* 37(5):46–54.
2017b Merle Franklin's Flyers. *Decoy Magazine* 41(4):8–13.

Ritchie, W. A.
1944 *The Pre-Iroquoian Occupations of New York State*. Memoir No. 1. Rochester Museum of Arts and Sciences, Rochester, New York.

1957 *Traces of Early Man in the Northeast.* Bulletin No. 358. New York State Museum and Science Service, Albany, New York.

Shott, M. B.
2017 Estimating the Magnitude of Private Collection of Points and Its Effects on Professional Survey Results: A Michigan Case Study. *Advances in Archaeological Practice* 5(2):125–137.
2018 The Ethics of Professional–Collector Collaboration. In *Collaborative Engagement: Working with Private Collections and Responsive Collectors*, edited by M. J. Shott, M. F. Seeman, and K. C. Nolan, pp. 1–6. Midwest Archaeological Conference Occasional Papers No. 3.

Shott, M. B., and B. Pitblado
2015 Introduction to the Theme "Pros and Cons of Consulting Collectors." *The SAA Archaeological Record* 15(5):11–13, 39.

Stothers, D. M.
1977 *The Princess Point Complex*. Mercury Series Paper No. 58. Archaeological Survey of Canada, National Museum of Man, Ottawa.

Trigger, B. A.
1978 William J. Wintemberg, Iroquoian Archaeologist. In *Essays in Northeastern Anthropology in Memory of Marian E. White*, edited by W. E. Engelbrecht and D. K. Grayson, pp. 5–21. Occasional Publications in Northeastern Anthropology No. 5. Department of Anthropology, Franklin Pierce College, Rindge, New Hampshire.

Wright, J. V.
1967 *The Laurel Tradition and the Middle Woodland Period.* Bulletin No. 217. National Museum of Canada, Ottawa.
1978 The Implications of Probable Early and Middle Archaic Points from Southern Ontario. *Canadian Journal of Archaeology* 2:59–78.

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Book Review

Droulers-Tsiionhiakwatha: Chef-lieu Iroquoien de Saint-Anicet à la fin du XVe siècle

(edited by Claude Chapdelaine)

Droulers-Tsiionhiakwatha: Chef-lieu Iroquoien de Saint-Anicet à la fin du XVe sècle, edited by Claude Chapdelaine. xx + 464 pages, 243 Figures, 144 tables, bibliographic references, DVD. 2019. Paléo-Québec 38. Recherches amérindiennes au Québec, Montréal. $30.00 (paper). ISBN 978–2–920366–50–3.

Iroquoian societies in southern Ontario and central New York have received significant academic attention over the past few decades (Fenton 1998; Starna 2008; Warrick 2000; Wright 1966). Less attention has been given to Iroquoians in the St. Lawrence River Valley. Through their edited monograph, Claude Chapdelaine and colleagues have taken a significant step toward correcting this issue. Their volume presents multidisciplinary work done on the Droulers/Tsiionhiakwatha site, part of a cluster of sites located along the St. Lawrence River, in the Saint-Anicet region of Québec. More than just a site report, however, many chapters in this volume discuss findings that are relevant to research outside the St. Lawrence Valley as well as Iroquoian archaeology more broadly and the volume as a whole provides a useful model for other site-level longitudinal studies.

The first thing worth mentioning to English-speakers in Canada and the United States is that this volume is published entirely in French. While certain words and phrases may be a bit challenging for non-native French-speakers, most chapters are eloquently written and provide an excellent tool for learning the language. It has been a problem in the past that Iroquoian literature published in English has not been consistently translated into French. Québec archaeologists, however, have put forth every effort to translate their work outside of this series. Hopefully in the future, English-speaking archaeologists will consider doing the same in French so that all scholars can partake in cross-language discourse.

This publication highlights the results of five years of excavation (2010, 2011, 2015, 2016, and 2017) completed by the Université de Montréal field school under the direction of Claude Chapdelaine and Pierre Corbeil. It incorporates earlier work done by Michel Gagné from 1994 to 1999 and subsequent public excavations from 2002 to 2009 under the direction of Mathieu Sévigny. Earlier seasons of this field school were conducted at two other sites of the "Saint-Anicet cluster," Mailhot-Curran and McDonald. All three sites are now published in the same series, with this publication on Droulers-Tsiionhiakwatha forming the final volume.

In both the title of this volume and the introductory chapter, Chapdelaine refers to Droulers as the "chef-lieu" (*tr.* capital) village of the Saint-Anicet region. This title is used to

denote the fact that at 1.3 hectares, the community likely housed a sizable population, averaging at least 500 individuals at any one time. This population estimate puts Droulers on par with larger St. Lawrence valley sites, such as Roebuck and McIvor. Chapdelaine also notes that the title "chef-lieu" is meant to emphasize the important position of Droulers in relation to other sites within the Saint-Anicet region. McDonald and Mailhot-Curran occupy less than a hectare of land, and, although data are limited, it is believed that Berry and Irving were likewise smaller in size.

Many of the questions posed in this study are directed at better understanding the processes that lead to the construction of such a prominent village at Droulers and how individuals living in the community organized themselves socially and politically to accommodate a larger population. At a broader level, the authors attempt to chronologically and culturally link Droulers to other major sites in the region, such as McDonald and Mailhot-Curran, and to better articulate the social processes that influenced cultural development in the Saint-Anicet region.

Given the series in which this work is published, and the terminology used to refer to certain aspects of the archaeological record, it is evident that this volume is aimed at an academic audience. The volume's logical organization, nevertheless, makes it easily comprehensible for archaeologists working outside the region. The introductory and concluding chapters also do an excellent job of synthesizing the data presented in the more technical sections of the work, making this information easily accessible to a wider audience.

The volume is organized into four parts: the history of excavation at Droulers, a detailed overview of the state of knowledge concerning St. Lawrence Iroquoians, an analysis of material culture and settlement patterns, and date estimates for the site using various techniques, such as Bayesian analysis and thermoluminescence.

Chapdelaine begins with a detailed review of the environmental and cultural background of the Saint-Anicet region. Using data on climate, geology, fauna, and other sources of information, Chapdelaine suggests several scenarios that may be used to explain the location of Droulers near the peak of a rocky moraine and attempts to infer whether or not defence was a motivating factor in the decision by the village's founders of where to settle.

At the site level, the primary goal of this study was to better describe the geophysical and spatial context of the site and consider the nature of social relationships and organization within the community. To this end, excavators posed two major questions: (1) What was the internal organization of the site? and (2) Was there a palisade? Seven longhouses and two large middens have been recorded at Droulers over the course of excavations by Gagné and the U of M field school; however, Chapdelaine speculates based on material frequencies and distributions that there could be as many as 15 structures present, including 8 in the unexcavated areas of the site. The excavators were not able to provide support for the presence of a palisade around the site; however, Chapdelaine notes that it is too early to make any definitive conclusions and that further research is needed to answer this question.

Regarding the longhouses, the excavators worked to define the use of space within and outside each household. Due to the rocky nature of the soil, postholes were not identified. However, analogical comparisons with other Iroquoian sites and the distribution of artifacts allowed the excavators to elucidate hearths, pits, and other interior features that presented useful information on domestic behaviour. One interesting find was that the longhouses at Droulers were constructed on three separate spatial alignments. This stands in contrast to Mailhot-Curran, where all six houses conform to an east–west orientation. Chapdelaine suggests that this configuration may represent a type of social organization aimed at addressing challenges posed by a larger population, although he is hesitant to refer to them as clan or other kinship groups.

The following chapters included thorough, in-depth analyses regarding different aspects of the material assemblage. A few samples:

François Courchesne, Claude Chapdelaine, and Julian Arsenault employ a unique approach to uncovering settlement patterns at Droulers via

geochemical analysis. Chemical signatures exclusive to hearths, middens, and pits have allowed the identification of these features through a sampling of soil from the top two horizons. This approach had been applied previously at Mailhot-Curran, also with successful results.

Marie-Ève Boisvert and Christian Gates St-Pierre's chapter offers an interesting synthesis of worked bone tools uncovered at Droulers, plus an intriguing intrasite spatial analysis near the end. The authors note that most longhouses at Droulers possess a similar amount of worked bone tools and debris. This observation excludes longhouse 1, which yielded comparatively little bone debris or tools. I would note that it also interesting that longhouse 1 contained the highest proportion of chipped lithic tools and debitage at the site.

Ronan Méhault uses Bayesian analysis to improve the resolution of radiocarbon dates collected from Droulers. Ten charred maize kernels and one piece of charred wood returned nine valid dates. The author used the program OxCal 4.3 (Bronk Ramsey 2009) to calibrate these dates, which returned a range of A.D. 1491–1515 at a 68.2 percent probability. When Droulers is modelled with other Saint-Anicet sites using a previously established sequence, the estimated dates for the site change only slightly. It is important to note, however, that many of these models include a *terminus ante quem* based on the assumption that Iroquoian groups had relocated from the St. Lawrence Valley by at least A.D. 1580. This assumption is addressed by Chapdelaine in an earlier publication (Chapdelaine 2016), but readers should be aware of its effect on the dates presented in this chapter.

It should be noted that an important aspect of the work at Droulers-Tsiionhiakwatha is its reliance on input from the public as well as the Mohawks of Akwesasne. This collaboration has greatly benefited the quality of work at the site and is a model for other large-scale archaeological projects going forward.

All things considered, this volume is an excellent resource for archaeologists and non-archaeologists alike. It provides an abundance of much-needed information on a site that adds to our knowledge of Iroquoian populations living in the St. Lawrence valley prior to European arrival, while also making sure to touch upon major subjects in the field. Chapdelaine concludes the volume with a cautionary note about the limits of the available data and provides a brief review of ongoing research in the Saint-Anicet region while acknowledging potential areas for future work. I highly recommend this volume for anyone looking to expand their knowledge of Iroquoian research!

References Cited

Bronk Ramsey, C.
2009 Bayesian Analysis of Radiocarbon Dates. *Radiocarbon* 51:337–360.

Chapdelaine, C.
2016 St. Lawrence Iroquoians as Middlemen or Observers: Review of Evidence in the Middle and Upper St. Lawrence Valley. In *Contact in the 16th Century: Networks among Fishers, Foragers, and Farmers,* edited by Brad Loewen and Claude Chapdelaine. Mercury Series Paper No. 176. Canadian Museum of History, Gatineau, Québec, and University of Ottawa Press, Ottawa.

Fenton, W. H.
1998 *The Great Law and the Longhouse.* The University of Oklahoma Press.

Starna, W.
2008 Retrospecting the Origins of the League of the Iroquois. In *Proceedings of the American Philosophical Society.* 152(3):279-321.

Warrick, G.
2000 The Precontact Iroquoian Occupation of Southern Ontario. *Journal of World Prehistory* 14(4):415-466.

Wright, J. V.
1966 *The Ontario Iroquois Tradition.* National Museum of Canada, Bulletin No. 210.

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