Mortuary Practices and Their Social Implications at the Keffer Site, Ontario

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Keffer (AkGv-14), a late 15th century Wendat site on the Don River, grew over a period of two to three decades to ultimately include 15 longhouses and a population estimated at 744 people. During its complete excavation, 29 individuals were recovered from 27 burial features, the majority of them in longhouses. Seventeen of these longhouse burials were of infants or young children. A detailed analysis of their placement in relation to the interior features of the longhouses suggests that reincarnation was the anticipated outcome of their burial, that reincarnation was viewed as a process rather than an event, and that care was taken to ensure that they would be reborn to an appropriate matriclan mother. The 12 other individuals described here include 4 from longhouses, 5 from elsewhere in the village, and 3 from a primary burial cemetery just outside the village. We also discuss the cultural and archaeological context of the numerous human bones from midden and other non-burial contexts within the village and from the ossuary in which the majority of the deceased villagers were buried. Although this paper involves a broad range of mortuary contexts, a comprehensive reconstruction of the Keffer mortuary programme is difficult because we do not have comparative osteological and dental data from the ossuary or from the other primary cemeteries presumed to exist beyond the village limits.

Introduction

The Keffer site (AkGv-14) was a late fifteenth-century Wendat (Huron) village located on the east side of the Don River (Figure 1), in the modern-day town of Vaughan, Ontario (Finlayson et al. 1985, 1987; D. Smith 1991, 2014). In 1984–1988, the site was thoroughly investigated in a major archaeological project directed by William D. Finlayson of the Museum of Indian Archaeology (now the Museum of Ontario Archaeology). The excavations revealed a palisaded village of some 2.2 ha with, at its maximum extent, 15 longhouses (Smith 2014).

In the following pages, the individuals recovered from burials in the village will be described. Also to be considered are other burial and non-burial contexts that produced human skeletal elements: the widely scattered "midden" bones, a small primary burial cemetery just outside the palisade, and the village ossuary. The multiple mortuary contexts in evidence at Keffer provide the opportunity for a more comprehensive understanding of Wendat social life and Wendat views on mortality and the afterlife than is often available in archaeological situations.

The continued expansion and remodelling of Keffer over the two to three decades of its existence is apparent from house extensions and overlaps, as well as expansions of the palisade. This growth was probably the result of both internal population increase and the incorporation of previously distinct communities. David Smith (2014) has documented the sequence. The first expansion occurred when two longhouses joined the original core of six longhouses. In subsequent years, the village grew slowly as further longhouses were built to house people joining the community. There were also occasional changes and additions

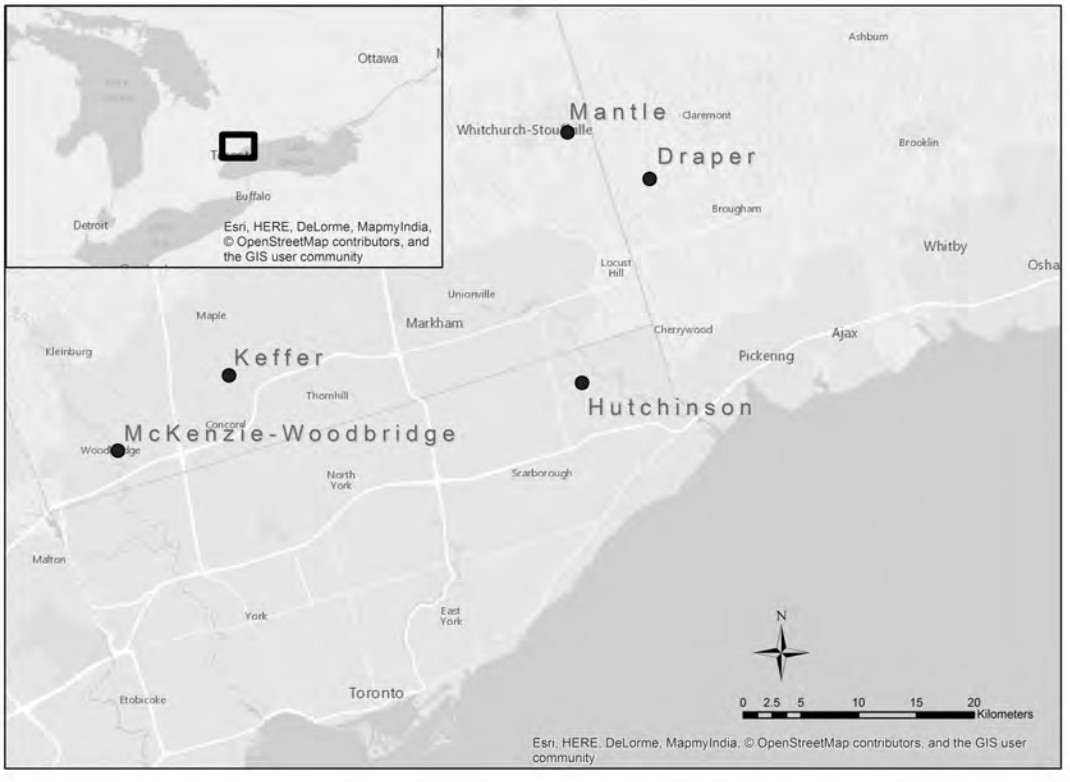

Figure 1. *Wendat sites in south-central Ontario*

to the palisade to accommodate the newcomers. In the eighth and final stage of development, the village's 15 longhouses were surrounded by a palisade which was doubled around the eastern edge, away from the river and facing the higher ground to the east.

Burial Excavation

In the course of the excavation, a number of mortuary features were discovered (Figure 2). Since the entire site was to be destroyed for a commercial development, these had to be fully exhumed. Whenever evidence of a human burial was encountered, Spence would take over the excavation of that feature. Preservation was poor, and several burials had been severely impacted by agricultural activities and topsoil clearing. A number of observations were made in the course of the excavation because there was no certainty that the skeletal elements could be recovered intact. In many cases crania were removed in blocks of their soil matrix, to be more carefully cleaned and documented in a laboratory setting. Metric data taken in the field, when compared with measurements done later on the same elements in the laboratory, proved to have an acceptable level of accuracy (Spence 1987).

The mortuary programme that prevailed among the Wendat at this time has been documented at a number of archaeological sites (Williamson and Steiss 2003). Individuals were buried at or soon after death, the "primary burial." At some later point, usually when the village moved to a new location, these individuals would be exhumed, stripped of their remaining soft tissue, and reburied together (the "secondary burial") in a single large pit, the ossuary. These ossuaries would thus hold numerous individuals, often in the hundreds. Most of these individuals would be incomplete, as some skeletal elements would be left behind in the original primary burial or would be excluded from the secondary burial.

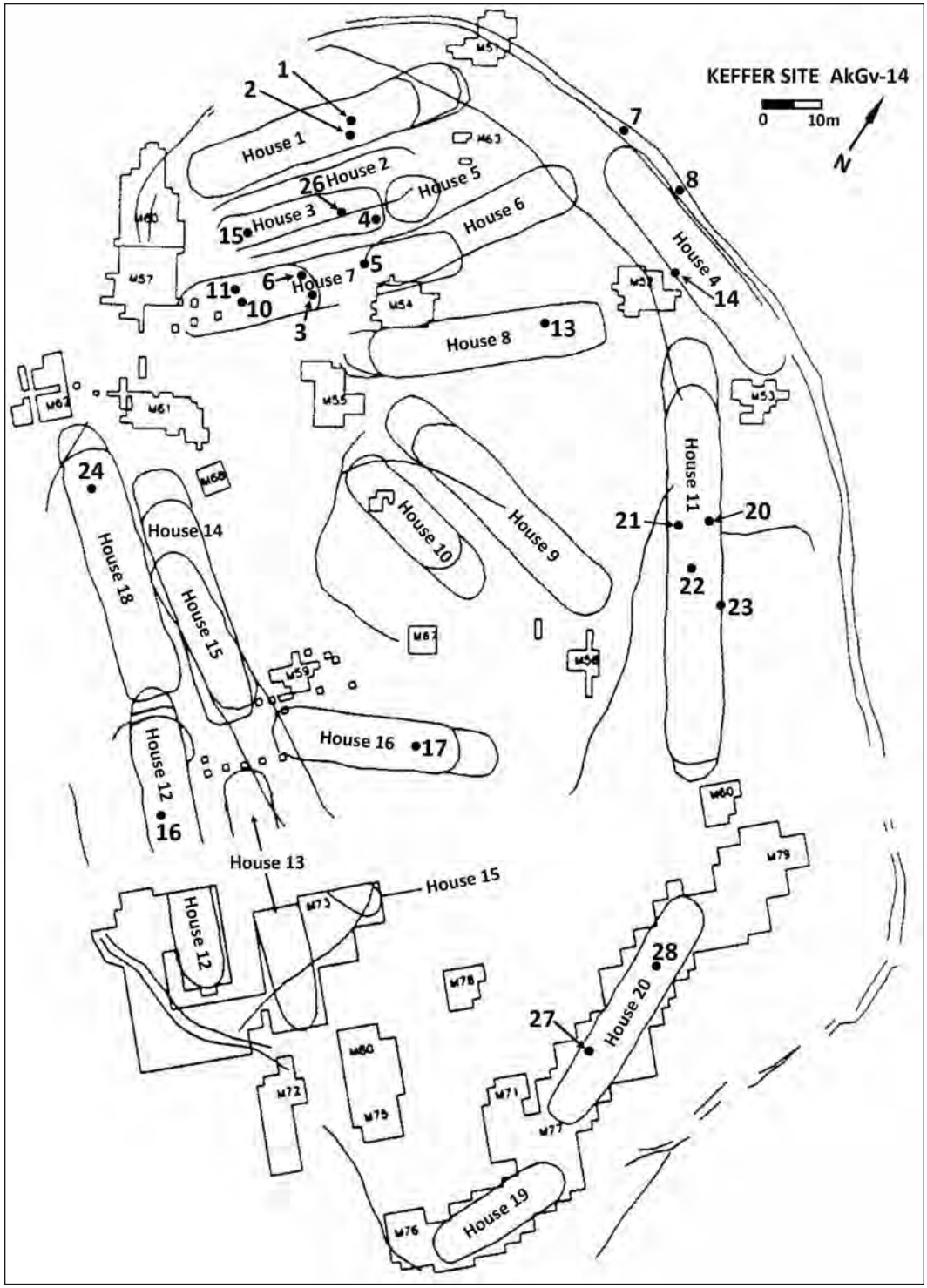

Figure 2. *Composite plan of the Keffer village, showing the eight stages of its development, together with the locations of the longhouse burials.*

Besides the recognizable burials at Keffer, there was also a large quantity of "scattered" or "midden" bone, elements that appeared as isolated finds or, rarely, small clusters in middens and features across the site (Rainey 2002). Some of these were probably elements that had been sorted out and excluded during the preparation of primary burials for their subsequent secondary and final burial in the ossuary. These elements were usually minor bones, such as those of the hands and feet, vertebral column, and ribs. It is difficult at times to distinguish such finds from the discarded remains of executed enemies, which may appear in similar contexts (Rainey 2002).

On the eastern edge of the village, just beyond the palisade, a number of features were found to contain human remains. Two of these held complete burials (Burials 18 and 19), while some of the others contained a few human bones or teeth and probably represent exhumed primary burials. This area, then, may have been a primary burial cemetery associated with the village.

The ossuary (AkGv-15) associated with the Keffer village was partially excavated by David Boyle (1889:20). A.J. Clark later included the ossuary in his 1925 map of the area but did no excavation in it. After considerable searching, it was again located in 1987, beneath the floor of a barn that had been erected in 1897. It is about 250 m southwest of the village, on the same side of the Don River. With the ossuary's location later firmly fixed and reported by Dana Poulton (D.R. Poulton and Associates 1998), it is now being protected from any further disturbance. There is a possibility that a second ossuary was also associated with Keffer (see below).

Osteological Analysis

Observations

Some measurements and observations were made in the field when it appeared that the bones were fragile and might not remain intact during excavation. Most measurements and observations, however, were deferred until the laboratory analysis. Measurements were done, where possible, on the crania and long bones. Trauma and skeletal and oral pathology were described. A number of non-metric skeletal observations were recorded following Molto (1983) and Hauser and De Stefano (1989). Morphological observations on the deciduous teeth follow Butler (1979) and Hanihara (1963).

Subadult Age Assessment

There are 21 subadults among the 29 individuals recovered from the burials (Table 1). Dental development and long bone lengths were recorded wherever possible and form the bases for age assessment. The data on most of these individuals have been presented in detail elsewhere (Saunders and Spence 1986) and need not be repeated here. However, six subadults were not included in that earlier set. Burial 7 (B7) produced only two measurements, and B27 and B28 were exhumed after the article had been published. B2, 19B, and 25B were beyond the age range (infancy) that was the focus of the article. Also, Saunders and Spence (1986) only presented data on the deciduous dentition.

Long bone measurements for B7, B27, and B28 can be found in Table 2. B2, 19B, and 25B had no measureable postcranial elements. Table 3 includes the dental data for the deciduous teeth of B27, B28, B2, B19, and B11, and also for the permanent teeth of B28, B2, B19, B6, and B11. The stages of dental formation followed here are those of Moorrees et al. (1963a, b). Where there was a difference between left and right antimeres, whether skeletal or dental, the more advanced side was used.

B25B was so poorly preserved that no data on either dental formation or long bone length could be retrieved. That individual has been assessed as 7–9 years of age on the basis of a single field observation: the mandibular left deciduous molars and first permanent molars had all erupted and had formed a level occlusal plane (following Ubelaker 1978: Figure 62).

The dental data (Table 3) suggest that B27 would fit into the dental seriation of Saunders and Spence (1986:Table 3) between P1 and K20, while B28 would fit between K11 and K6. There are no dental data for B7, but the two long bone measurements (Table 2) indicate placement between D5 and D11 in the metric sequence of Saunders and Spence (1986:Table 4).

Table 1. *Subadult ages.*

B no.	MFH 1963a	Smith 1991	Ubelaker 1978	SB 2000	Assigned Age	Age Category
26	–	–	–	31w	31w	fetal infant
22B	1.1m	–	28w	33w	33w	fetal infant
8	–	–	28w	33w	33w	fetal infant
7	–	–	–	38w	38w	neonate infant
22A	1.8m	–	birth	39w	39w	neonate infant
24	2.0m	–	birth	40w	40w	neonate infant
16	0.3m	–	birth	40w	40w	neonate infant
10	2.3m	–	birth	40w	40w	neonate infant
23	2.2m	–	birth	42w	42w	neonate infant
27	3.6m	–	birth	42w	42w	neonate infant
20	3.7m	–	6m	3m	6m	postneonate infant
17	3.7m	–	6m	3m	6m	postneonate infant
15	3.7m	–	6m	3m	6m	postneonate infant
21	10.2m	–	1y	6m	1y	postneonate infant
1	7.8m	–	9m	6m–1y	9m	postneonate infant
11	21.5m	1.8–1.9y	1.5–2y	1.5–2y	1.5–2y	young child
28	21.3m	3.1–4.3y	3y	1.5–2y	3y	young child
6	29.1m	4y	4–5y	2.5–3y	4y	young child
2	31.5m	4.4–5.4y	4–5y	–	4–5y	young child
19B	64.0m	6.5–7.6y	8y	–	7–8y	older child
25B	–	–	7–9y	–	7–9y	older child

w = weeks in utero; m = months; y = years

Saunders and Spence (1986:51) found that the Moorrees et al.'s (1963a) deciduous dental standards tended to over-age their infant Ontario Iroquoian series. The Scheuer et al. (1980) regression formula for estimating infant age from femoral length provided more acceptable ages. The Moorrees et al. (1963b) standards for permanent teeth, as elaborated by B.H. Smith (1991; see also Scheuer and Black 2000: Figure 5.26) are useful for children beyond infancy. Recently, the dental formation and eruption chart presented by Ubelaker (1978: Figure 62) has been favoured in the analysis of Iroquoian subadults (Crinnion et al. 2003; Forrest 2010a). It has the advantage of being tilted toward North American First Nations people, believed by Ubelaker (1978:46) to mature dentally somewhat more rapidly than the White subjects on whom most dental standards are based.

Table 2. *Subadult long bone measurements (mm): additional subjects.**

Element	B7	B27	B28
humerus	–	73	123
radius	52	60	96
ulna	60	68	109
femur	–	85	–
tibia	–	76	–
fibula	–	73	125

* for other subadults, see Saunders and Spence (1986)

Table 3. *Additional dental formation data.* *

deciduous dentition						
	B27	**B11**	**B28**	**B6**	**B2**	**B19B**
max. I1	–	Ac	Ac	–	Ac	–
max. I2	–	Ac	Ac	–	Ac	–
max. C	Cr¾	Rc	Rc	–	Ac	–
max. M1	Cr¾	–	–	–	Ac	–
max. M2	–	–	–	–	Ac	–
mand. I1	R¼	Ac	Ac	–	–	–
mand. I2	Crc	Ac	Ac	–	–	–
mand. C	Cr¾	Rc	Rc	–	Ac	–
mand. M1	Cr¾	A½	A½	–	Ac	Res¼
mand. M2	Coc	R¾	–	–	Ac	–
permanent dentition						
	B27	**B11**	**B28**	**B6**	**B2**	**B19B**
max. I1	–	–	Cr¾	Crc	Crc	–
max. I2	–	–	–	Cr¾	Crc	–
max. C	–	–	–	Cr½	Ri	–
max. M1	–	–	Ri	Ri	–	–
max. M2	–	–	–	Cco	–	–
mand. I1	–	–	–	–	R¼	–
mand. I2	–	–	Crc	Crc	Crc	–
mand. C	–	–	Cr¾	Cr¾	Crc	–
mand P1	–	–	–	–	Crc	–
mand P2	–	–	–	–	Crc	–
mand. M1	–	Cr¾	Ri	Cli	R¼	Rc
mand. M2	–	–	–	Cco	Cr½	Ri

* for data on other subadults, see Saunders and Spence (1986:Table 3)

In the present analysis, a variety of ageing techniques were applied (Table 1): the Moorrees, Fanning, and Hunt (1963a) standards for deciduous teeth; the B. Smith (1991) standards for permanent teeth; the Ubelaker (1978: Figure 62) chart for the formation and eruption of both deciduous and permanent teeth; the Scheuer and Black (2000:Tables 9.10, 9.16, 11.15) linear regression formulae for fetal and neonatal long bones; and the Scheuer and Black (2000:Tables 9.6, 9.13, 9.18, 11.6, 11.13, 11.17) long bone tables, derived from Maresh (1970), for subadults past the first month of infancy. The Scheuer and Black regression formulae offer ages similar to those based on Ubelaker's dental chart for fetal and neonatal infants, while the ages assigned by Moorrees et al. (1963a) are too advanced (Table 1). The neonate category coincides well with Stewart's (1979:131-134) "birth size concentrations" in an Arikara series (Saunders and Spence 1986).

For older infants and children, the B. Smith (1991) and Ubelaker (1978) systems produce comparable ages, while the tables of Scheuer and Black (2000) generally indicate younger ages. This discrepancy has been noted for Northern Iroquoians by other investigators, who suggest that it is due to long bone growth suppression caused by weaning difficulties and dietary deficiencies (Dupras 2003; Forrest 2010a). Dental formation is considered to be a more reliable indicator because it is less susceptible to interruption during episodes of stress (Dupras 2003:298-299). In the older Keffer subadults, the dental data will be given primacy in assigning ages (Table 1).

There are clearly several problems with assigning specific ages to subadult skeletons. Different techniques give different ages, and there is no way to control for the sex differences in the maturation rates of both teeth and bones. It may be better, then, to place the subadults in broader age categories that will still have some usefulness but will reduce the possibility of error. Those used here are: fetal infant (FI) for infants younger than 36 fetal weeks; neonatal infant (NI) for infants who died between 36 fetal weeks and 4 postnatal weeks; postneonatal infant (PI) for infants between 1 month and 1 year; young child (YC) for children from 1 to 6 years; and older child (OC) for those above 6 years (Table 1).

Adult Sex and Age Assessment

Because of poor preservation, observations of sex characteristics were made where possible while the bone was still *in situ*. In some cases, the pelvic elements were removed in a block of their soil matrix, to be more carefully cleaned in the laboratory. The three Phenice (1969) criteria were

considered to be the most important sex indicators, with the sciatic notch, preauricular sulcus, and sub-pubic angle used as supplementary evidence. Cranial indicators (Buikstra and Ubelaker 1994:19-20) were also considered, but these were given less weight. The pelvic data indicate that B3, B5, and B18 are male, while B4 is female. Cranial features mark B13 as a male and B25A as a female. The sex of B9 and B19A is indeterminate.

Ages were assessed with a variety of techniques, depending largely on which elements

Table 4. *Burial inventory.*

Burial #	Sex	Age*	Provenience	Type	Position	Goods
1	–	PI	H1	primary	flexed	absent
2	–	YC	H1	primary	flexed	absent
3	M	MA	H7 Burial Area	primary	flexed	absent
4	F	YA	H3 end cubicle	primary	flexed	absent
5	M	YA	H7 Burial Area	primary	flexed	absent
6	–	YC	H7 Burial Area	primary	flexed	absent
7	–	NI	east palisade	primary	extended	absent
8	–	FI	east palisade	primary	flexed	absent
9	–	adult	east palisade	unknown	–	–
10	–	NI	H7	primary	casual	absent
11	–	YC	H7	primary	flexed	absent
13	M	MA	H8	secondary	–	absent
15	–	PI	H2 or H3	primary	flexed	raccoon baculum
16	–	NI	H12	primary	–	–
17	–	PI	H16	primary	flexed	absent
18	M	MA	primary cemetery	primary	flexed	absent
19A	–	MA	primary cemetery	primary	flexed	absent
19B	–	OC	primary cemetery	primary	flexed	absent
20	–	PI	H11	primary	extended	slate pendant
21	–	PI	H11	primary	extended	absent
22A	–	NI	H11	primary	extended	absent
22B	–	FI	H11	primary?	flexed bundle	fish vertebrae
23	–	NI	H11	primary	flexed	absent
24	–	NI	H18	primary	extended prone	absent
25A	F	adult	open area	primary	flexed	absent
25B	–	OC	open area	primary	–	absent
26	–	FI	H3	primary?	–	absent
27	–	NI	H20	primary	flexed	absent
28	–	YC	H20	primary	flexed	Absent

* FI: fetal infant (33–35 fetal weeks); NI: neonatal infant (36 fetal weeks–1 month); PI: postneonatal infant (1–12 months); YC: young child (1–6 years); OC: older child (6+)

were present and well enough preserved for observation. Preference was given to the symphysis pubis technique of Suchey and Katz (1998) and to the auricular area technique of Lovejoy et al. (1985), as modified by Osborne et al. (2004). Less reliable but still useful were cranial suture closure (Meindl and Lovejoy 1985) and dental attrition (Melbye 1983). Epiphyseal fusion was important in a few cases.

The basis for the age assessment of each adult will be noted in the individual descriptions. As is always the case in these assessments, the possible ranges are broad and the assessments are somewhat uncertain. As with the subadults, assignment to a category rather than a narrowly defined specific age is preferable. These are: young adult (YA), ages 18–35 years, and middle adult (MA), ages 35–50 years (Table 4). There are no older adults.

The Burials

Data Presentation

The basic data for each of the Keffer site burials are presented in Table 4, namely, sex, age category, provenience, type of burial, position, and grave goods (if any). Body orientation is given in the individual descriptions below. It follows the head–torso axis, with the head end presented first. The methods used for the assignment of subadult age and their results are presented in Table 1.

Burial provenience within the longhouses is described in terms of the house architectural elements. These include such features as the end cubicles and side benches or platforms noted by seventeenth-century French observers and recognized by archaeologists (Dodd 1984). Both features are visible in the Keffer houses. The end cubicles, probably used for storage, are often present at both ends. They are distinguishable by a line of posts separating them from the domestic space and by a relative paucity of interior features, such as postholes and pits. Side platforms, probably used for a variety of domestic activities and storage, run along the length of both walls. They are visible through a line of support posts and through the scarcity of features beneath them.

Other elements of interior space have been identified by Creese (2009, 2011). In his initial Late Ontario Iroquoian period (A.D. 1420–1500), the time span in which Keffer was occupied, he notes two lines of outer support posts (P1 and P5), one on each side of the house (see Figure 3). These mark the inner edges of the side platforms/benches and the outer edges of the house's central corridor. The mean width of the side platforms is slightly under 1.7 m, so they would take up 3.3 m of the house width in total (mean house width is 7.5 m), leaving a central corridor 4.2 m wide (Creese 2011:Table 7.2).

However, Creese (2011) notes that the central corridor can be subdivided. He identifies a second, inner row of support posts (P2 and P4) running along the corridor on each side of the house. Although they are spaced somewhat erratically along the length of the house, making them often difficult to identify, their lateral placement as a function of house width is remarkably consistent. They divide the central corridor into three linear segments, two lateral zones (between the P1 and P2 and P4 and P5 rows of support posts) and a central zone (between P2 and P4; see Figure 3). The lateral zones, each about 1.4 m wide, blend into the central zone, which is also about 1.4 m

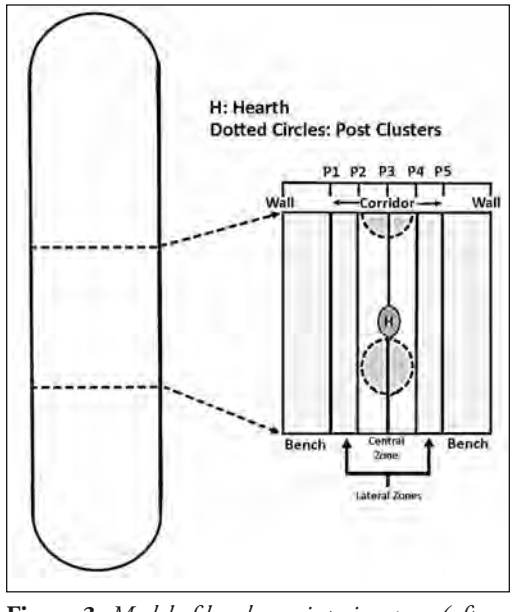

Figure 3. *Model of longhouse interior space (after Creese 2011, 2012: Figure 6).*

wide. Along the central zone are ranged a series of hearths, occasional midline support posts, and numerous smaller posts, many of them grouped in circular clusters that probably represent above-ground sweat lodges (see Creese 2012:Figure 6).

Still another division of interior space is formed by family cubicles, the segments of the longhouse interior assigned to each nuclear family. Although there are usually no clear posthole lines separating them, they can be inferred from the distribution of hearths and posthole clusters along the midline (Creese 2011:284, 300). Using Snow's (1994:43) terminology, each nuclear family would have occupied a family cubicle, consisting of a section of the side platform and adjacent lateral corridor zone on one side of the central corridor zone. The central zone itself and its features (hearths, sweat lodges, and other features) would have been shared by the two families facing each other across it. Given the degree of intimacy that this would have entailed, it is likely that the two nuclear families were related, perhaps as siblings or as parents and offspring. This whole segment of the longhouse, then, can be termed a dyad compartment, housing two presumably related nuclear families, and each half a family cubicle, housing one of those families (Creese 2012:373-375; Snow 1994). Although the side platform would have been solely private space, the lateral and central corridor zones would have been to a limited degree also public, allowing the passage of other residents and perhaps visitors through the longhouse. The location of the longhouse burials with respect to other interior features can be seen in Figures 4–13.

Burial 1

B1 was in a pit in the central zone of House 1 (H1) (Figure 4). The pit intersected a midline hearth. The age of B1 was approximately nine months, a postneonatal infant (PI) (Table 1). The torso rested prone, with the head turned to the right, the arms by the sides, and the legs flexed to the right. The orientation was SW–NE, generally aligned with the long axis of the house.

Burial 2

Also in H1 and in the same dyad compartment as B1, B2 was a primary burial in a pit beneath the south side platform, just under its inner edge (Figure 4). B2 was a young child, 4–5 years of age. The body axis was NE–SW, again aligned with the house. The child rested on the right side, the arms and legs flexed in front of the body.

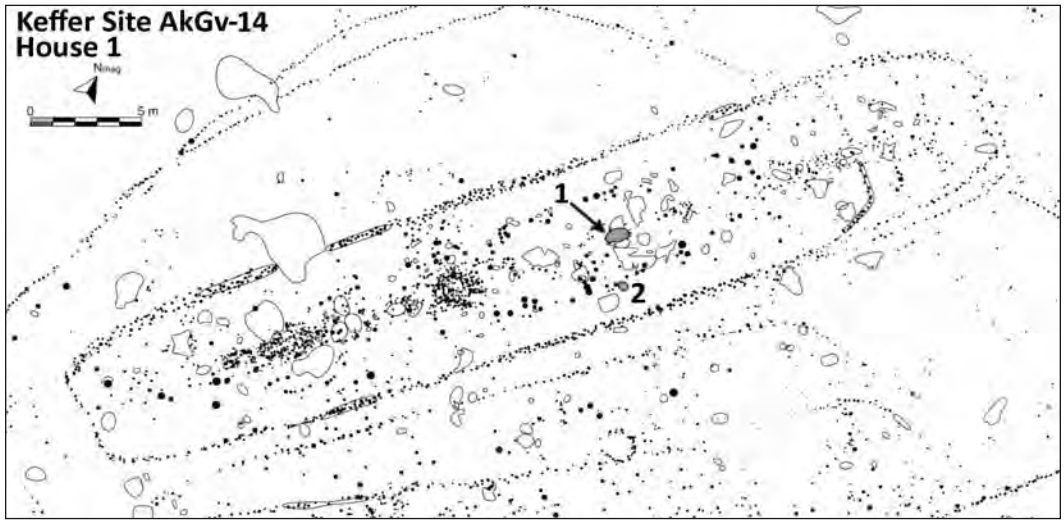

Figure 4. *House 1, with Burials 1 and 2.*

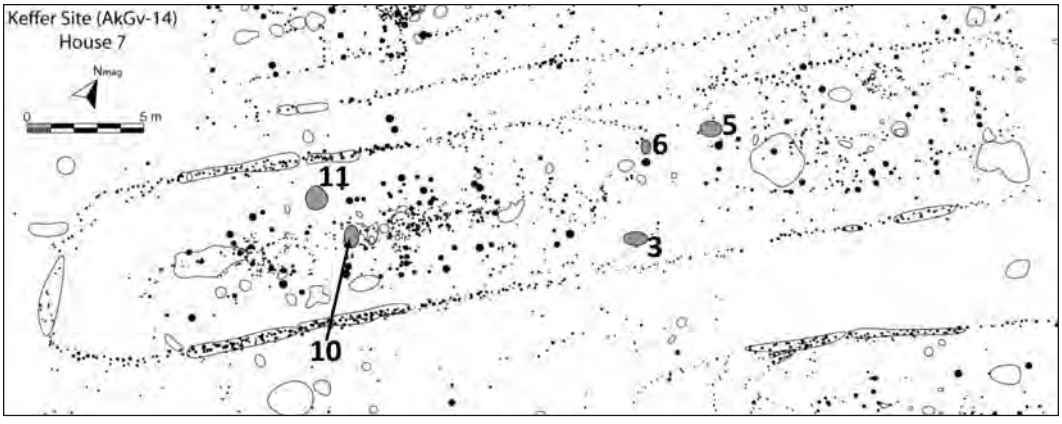

Figure 5. *House 7, with Burials 3, 5, 6, 10, and 11.*

Burial 3

B3 was the primary burial of an adult man in H7 (Figure 5). It was one of three burials (B3, B5, B6) placed near one another in a part of H7 that is difficult to interpret, in part because of a partial overlap with the later H6. It appears that H7 was constructed first and then expanded to the east. However, the expansion left an unoccupied area in the middle of the extended house. This area included the original east end cubicle and the first few metres of the extension, in all a space some 7 m long that was devoid of evidence of occupation. The side platforms were absent there, but appear again farther east in the extension. A gap in the south wall of the extension at this point would have allowed access to this area from outside the house.

With three individuals placed in it, this area would seem to have been devoted primarily to burial. It may also have continued the presumed storage function of the end cubicle that preceded it, but there is little evidence of other activities and none of residence. It will be referred to in future as the H7 Burial Area. B3 was located just inside the original curving east end wall of the house, perhaps even intruding slightly into the post line.

The auricular area corresponds to phase 4 of Osborne et al. (2004), with a mean age and standard deviation of 47.8 ± 13.95 years. The symphysis pubis is in Suchey and Katz's (1998) phase V, 45.6 ± 10.4 years. Placement in the middle adult (MA) age category seems appropriate. The body had been placed on its left side, oriented W–E, in a very tightly flexed position. Some form of binding may have maintained the position.

Burial 4

B4 was a very poorly preserved adult woman primary burial in H3 (Figure 6). The mortuary feature was in an end cubicle, just inside the curving east end wall of the extended H3, in much the same sort of context as B3. The auricular area morphology falls in phase 2 of Osborne et al. (2004), 29.5 ± 8.2 years. The body was oriented SE–NW, on the right side, with the arms and legs tightly flexed in front. The cranium and mandible were missing, except for a couple of teeth and a fragment of sphenoid, having been removed by ploughing or topsoil clearing.

Burial 5

The B5 pit was in the H7 Burial Area (Figure 5). However, the overlapping H6 features create some confusion here. B5 appears to have been placed in the curving west end wall of H6, but the wall trajectory was not clear in this area. The burial probably preceded H6 and was thus contemporary (in architectural terms) with B3 and B6.

B5 was a young adult man. Some skeletal elements had only recently fused (the distal radius, rib heads, and vertebral epiphyseal rings). The medial epiphysis of the clavicle is still separate, while the iliac crest is fully fused, suggesting an age between 18 and 21 years (Webb and Suchey

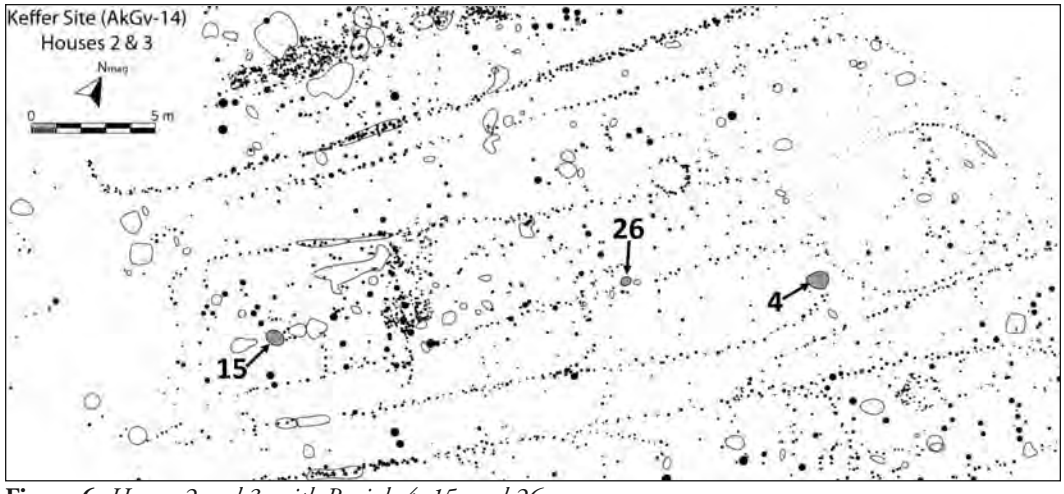

Figure 6. *Houses 2 and 3, with Burials 4, 15, and 26.*

1985). The pubis symphysis is in phase 1 of Suchey and Katz (1998), for an age of 18.5 ± 2.1 years.

The burial was on its right side, the arms and legs tightly flexed in front. It may have been wrapped or bound. The orientation was SW–NE.

Burial 6

B6, like B3 and B5, was in the H7 Burial Area (Figure 5). Although post patterns in the area were not completely clear, the burial pit seems to have been placed in or just inside the curving line of posts that formed the east end wall of the original H7, just like B3.

The B6 individual was a young child, about 4 years old. The body was on its left side, with the legs and arms flexed. The orientation was S–N.

Burial 7

B7 had been placed in the narrow space between the two rows of posts that formed the double palisade enclosing the village on the east (Figure 7). At about 38 fetal weeks of age, it is the youngest individual in the neonatal category. The skeleton had been badly disturbed by agricultural activities and topsoil clearing, with the cranium, mandible, and upper six cervical vertebrae completely removed. However, enough elements remained in position to establish that the infant had been placed on its back, oriented SE–NW, with the legs extended and the arms along the sides.

Burial 8

B8, like B7, was buried between the rows of the double palisade around the eastern edge of the village (Figure 7). This burial was about 15 m to the southeast of B7. The age was only about 33 fetal weeks, indicating that the fetus was a miscarriage late in the pregnancy. The body was oriented W–E. It rested prone, with the legs flexed to the left and the head turned to the left. The arms were by the sides.

Burial 9

B9 had been placed in a pit in an irregular part of the eastern palisade, some 40 m along from B8 (Figure 8). Unfortunately, the burial was almost completely destroyed during topsoil removal. Only a few bone fragments remained in the feature, and they had been displaced from their original positions. The rest of the bones had to be recovered from the truck that was carrying the soil. All of the bone was very fragmented and incomplete.

B9 was an adult, to judge by the size of the bones and the few observations on fusion that were possible. No more specific age category could be assigned, and sex could not be determined. The recovered bones consist of a fragment of right

mandibular ramus; part of the left scapula; and fragments of both femora, both tibiae, both ulnae, the left humerus, the left fibula, and a radius. Elements completely absent include the cranium, teeth, clavicles, ribs, vertebrae, sacrum, innominates, hands, and feet. Some, such as the cranium, may have been removed some years ago during agricultural activities, and some may have

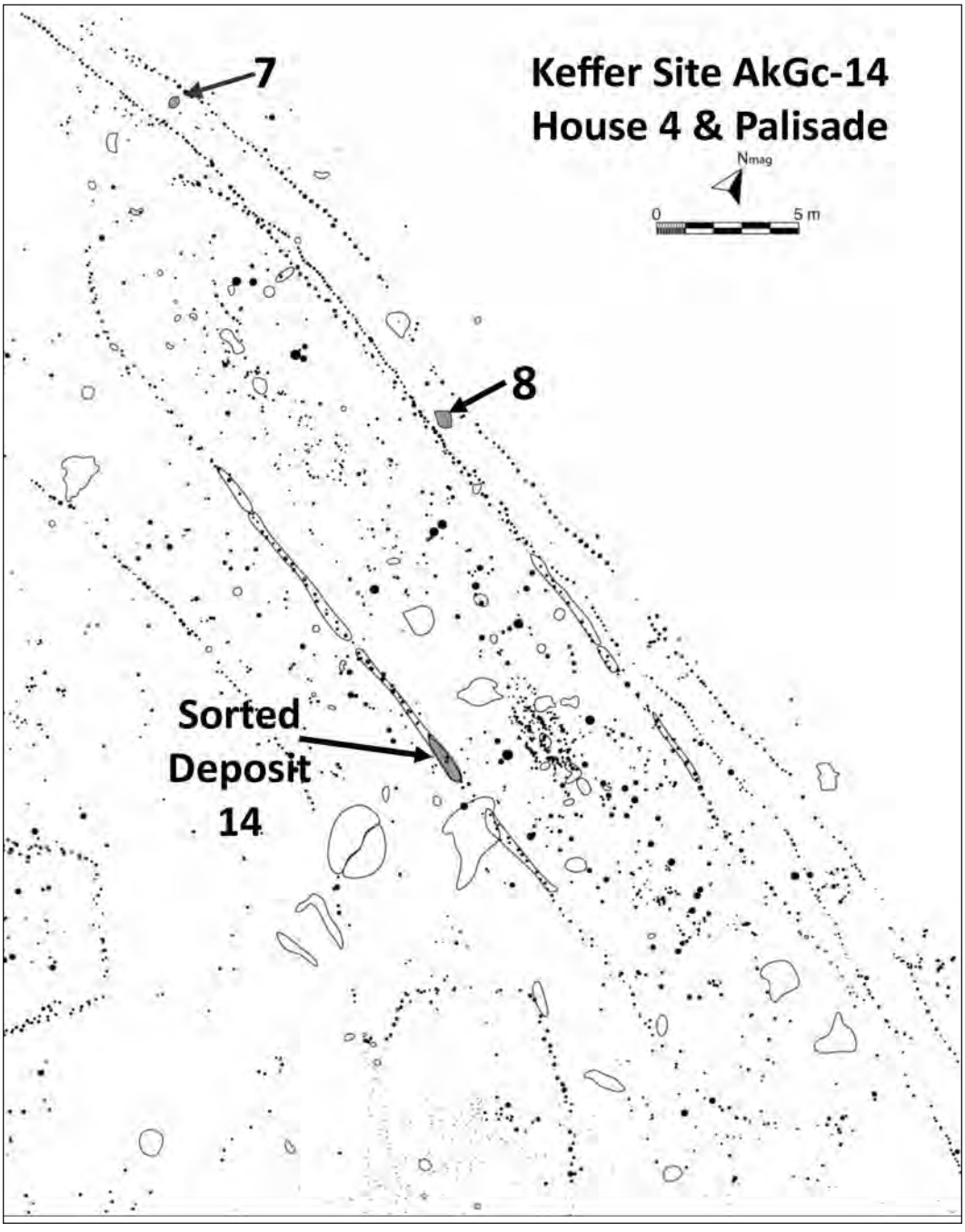

Figure 7. *House 4, with Burials 7 and 8 and sorted deposit 14.*

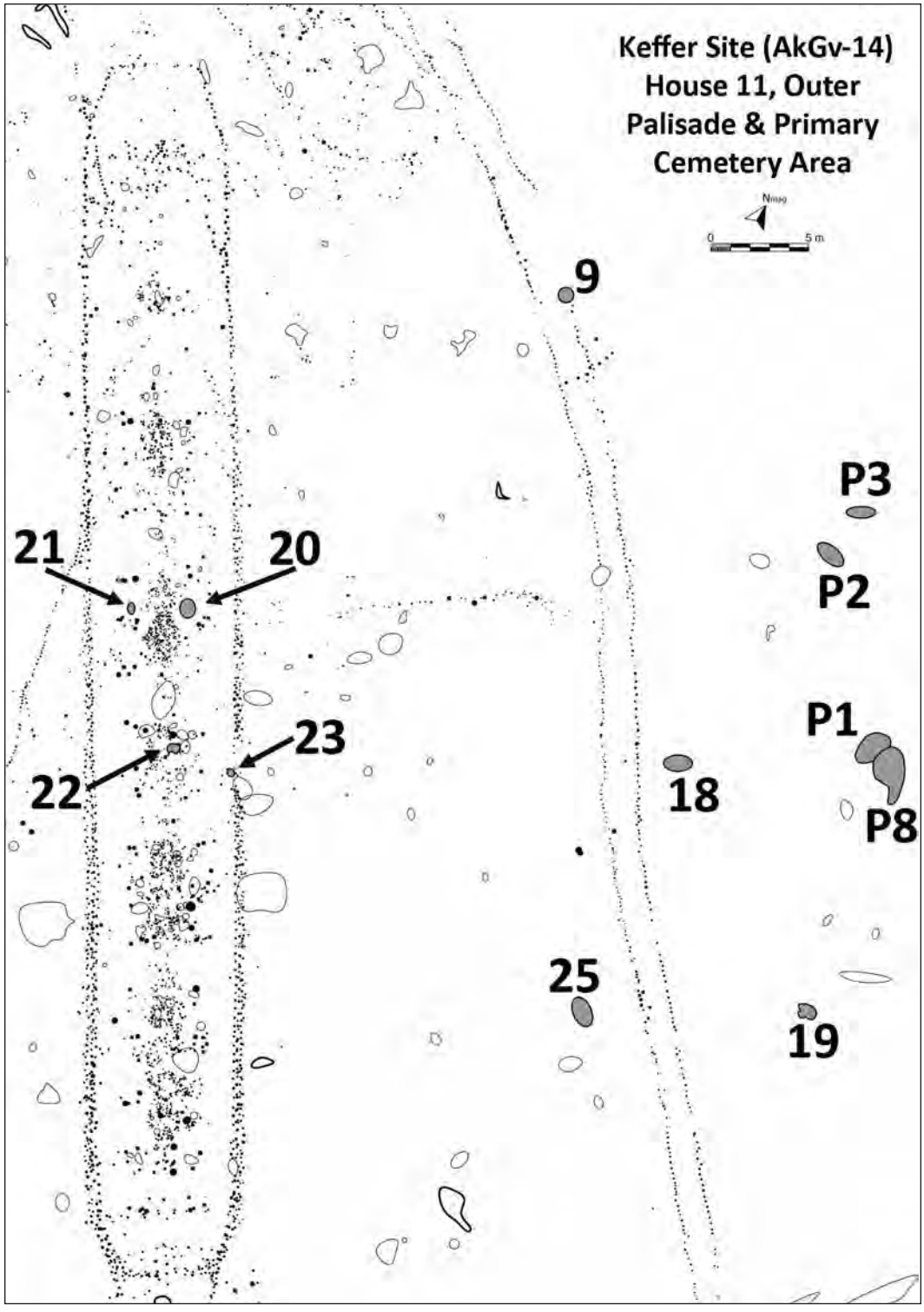

Figure 8. *House 11 and the east edge of the village, with the primary cemetery and Burials 9, 18–23, and 25.*

been missed when the truck load was searched. The pattern of bones identified vs. those missing suggests that B9 may have been a secondary burial, but it is also possible that it was an unexhumed primary burial whose missing elements had been carried off in the truck.

The significance of B9's location is not clear. The burial may have been deliberately placed in an entrance in the palisade. It is also possible that B9 was an early outlier of the primary cemetery area located east of the village, and that it was rediscovered when the double palisade was constructed. The irregularity in the palisade at that point may reflect an attempt to avoid the burial (Figure 8).

Burial 10

B10 was a neonatal infant buried in a pit in the central zone of the H7 corridor (Figure 5). The infant was prone, with the head facing down and slightly to the left. Because of the curvature of the pit base, the legs were raised slightly above the level of the rest of the body. Their position is best characterized as sprawled, the left leg flexed to the left and the right leg flexed more loosely to the right. The arms were extended by the sides, bent only slightly at the elbows. The orientation was SW–NE.

Burial 11

Also in H7, B11 was a young child of 1.5–2 years. The body was in a pit beneath the north side platform, near its inner edge, and in the same dyad compartment as B10 (Figure 5). B11 was lying on the left side with the arms and legs flexed in front. The orientation was N–S.

Burial 13

B13 was an unusual burial. The bones are those of a male in middle age, to judge by suture closure (Meindl and Lovejoy 1985). They were in a pit in H8, beneath the north side platform, near its inner (southern) edge (Figure 9). The burial had been disturbed by ploughing which, besides causing other damage, had removed the upper part of the cranium. Despite this, it is clear that B13 was a secondary burial. The only articulated elements were a segment of the vertebral column from the fifth thoracic to the second lumbar. The thoracic end of the segment was undisturbed, but the lumbar end extended into the ploughzone and may have lost some elements.

The vertebral segment curved around the cranium. The mandible was partially beside and partially beneath the cranium, but not articulated with it. A number of other elements, none in articulation, had been deposited rather haphazardly around the cranium: the right radius and humerus; the manubrium; 3 cervical vertebrae (C1, C4–5); 1 left and 1 right ribs; left triquetrum and left trapezoid; 3 hand phalanges (2 proximal and 1 middle row); the left cuboid and right navicular; and 3 foot phalanges (all proximal row).

None of the bones show cutmarks. There has been postmortem loss of all the incisors and canines, and the lower right premolars and lower left first premolar, but none of them were recovered in the pit. Rodent gnawing is present on the right occipital condyle, and the two halves of a mouse (*Peromyscus maniculatus*) mandible were found inside the cranium. It may be that the primary burial was above ground, allowing mice access to the remains. When collected for the secondary burial, decomposition must have been quite advanced. The vertebral column was still held together by its tenacious muscles and ligaments, but most of the rest of the body was probably largely or completely skeletonized. A number of the lesser bones, including most of the ribs, hands, and feet, may have been left behind in the primary burial. The single-root anterior teeth had probably fallen out and were also left there. However, the absence of most of the long bones is somewhat puzzling. They may have been placed higher in the pit and were removed by the plough.

Burial 15

At six months of age, B15 was a postneonatal infant. The burial was located in an area where H2 and H3 overlap, so it cannot be assigned to one or the other house (Figure 6). If it had been placed there while the earlier H2 was present, it would have been either under the south side platform, near its inner edge, or in the adjacent lateral corridor zone. If it was a H3 burial, it would have

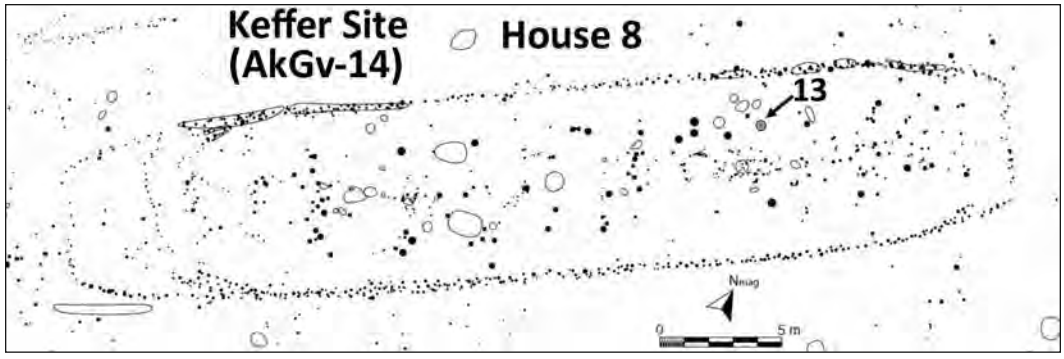

Figure 9. *House 8, with Burial 13.*

been in the central zone, between two hearths. Although it would have been near the western end of either house, in neither case would the burial have been in an end cubicle.

The body was oriented W–E, lying prone with the legs flexed to the right and the head turned partially to the right. The arms were by the sides. During the initial archaeological testing of the feature, a raccoon baculum was recovered. Although only identified during screening of the soil, rather than *in situ*, it must have come from the area of the lower legs. A raccoon baculum had also been placed with the burial of a historic period Neutral/Attawandaron infant at the Hood site, which Fitzgerald (1979:52) suggests was a symbol of fertility. At the Adams site in New York, an adult male burial contained 11 raccoon bacula, which Engelbrecht (2003:14) also relates to the animal's potency. It is not clear why a potency or fertility amulet would be buried with a deceased infant. Perhaps it was meant to stimulate the sexual activity or increase the fertility of the hopeful parents, ensuring a pregnancy that would result in the infant's rebirth.

Burial 16

B16 was a neonatal infant buried in a support posthole in H12 (Figure 10). Unfortunately, the burial was removed from the feature before it was recognized as being human. There is thus no information on its position or orientation. However, the completeness of the recovered skeleton indicates that it had been a primary burial.

The size of the posthole, 20 × 25 cm at the subsoil surface, and its depth, extending 50 cm from that level, indicate that it had been intended as a support post. However, it is not clear whether it was to be a side platform support post, part of Creese's (2009) P1 and P5 rows, or an inner support post, part of Creese's P2 and P4 rows. In any event, the burial would have been in one of the longhouse's family cubicles, either under the side platform edge or in the lateral corridor zone.

The fill of the posthole was uniform, not stratified, a mottled mixture of topsoil and subsoil with some apparent trash (sherds, faunal elements) and charcoal. It extended from the top of the posthole to its base beneath the burial. Apparently the infant died while H12 was under construction, and an open posthole was then used for the burial. Another posthole of equivalent size and in the same position relative to house width was located about a metre farther along the house. It was probably the structural replacement for the posthole that had been used for the burial.

Burial 17

B17 was a postneonatal infant of about six months. The burial was in the central corridor zone of H16 (Figure 11). It was near the east end of the longhouse, but not in the end cubicle. The body had been placed on its left side, oriented W–E, with the arms loosely flexed and the legs more tightly flexed.

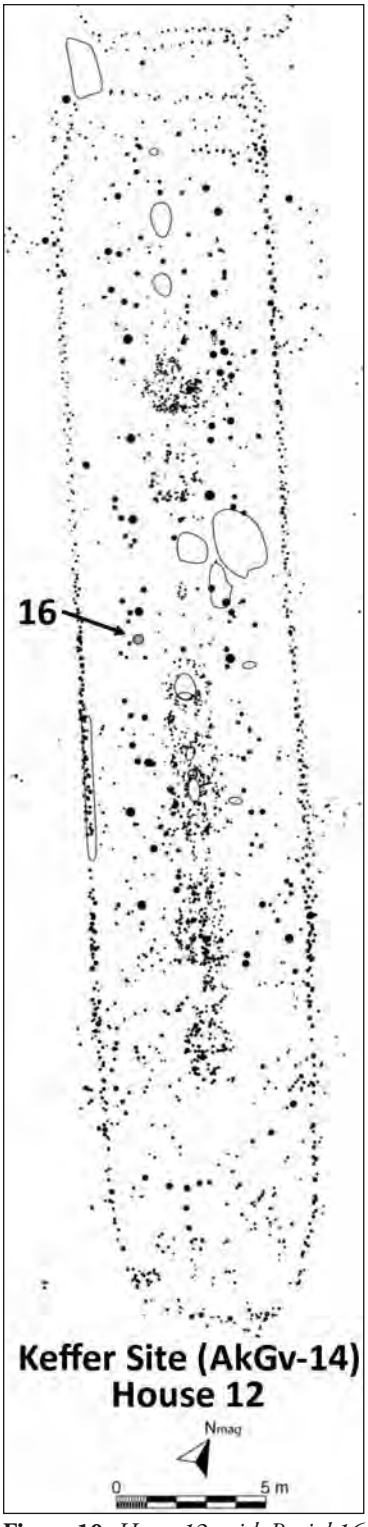

Figure 10. *House 12, with Burial 16.*

Burial 18

B18 was a male adult in a pit 5 m outside the eastern double palisade (Figure 8). The burial was on the western edge of the cemetery, an area of several features that seems to have been a primary burial area. Preservation was very poor, with the additional complication of damage from ploughing and topsoil clearance. The age estimate of 35–50 years is based on cranial suture closure (Meindl and Lovejoy 1985).

The skeleton was on its right side, oriented N–S. The arms and legs were tightly flexed in front. Some form of binding or wrapping may have been used to sustain the position.

Burial 19

B19 was also in the cemetery, east of the palisade and about 15 m southeast of B18 (Figure 8). It was actually two burials. Pit outlines show that the burial of an adult, B19A, intruded into the earlier burial of B19B, a child of 7–8 years (Table 1). Both skeletons had been damaged by ploughing and topsoil clearing, and were in very poor condition. The sex of B19A could not be determined. Age, by cranial suture closure, was about 40–50 years (Meindl and Lovejoy 1985).

B19B, the child, rested on its right side. The arms were flexed in front, but the position of the torso and lower limbs could not be determined. B19A had been placed slightly behind B19B, disturbing the area of the child's torso. Both were oriented W–E. B19A was also resting on the right side, with the arms and legs tightly flexed in front. The intrusion of B19A into the grave of B19B may have been a deliberate attempt to place the two individuals together.

Burial 20

B20 was one of five infants buried in four H11 features (Figure 8). The pit was in the eastern lateral corridor zone in the central part of the longhouse. The infant was six months old, a postneonatal infant. The orientation was N–S, and the position is best characterized as extended. The body rested on its back, the arms extended by the sides. The right leg was fully extended, while the left was bent at the knee to place the left ankle over the right knee.

A slate pendant was in the pit, probably as a grave offering, although its precise relationship to the body is not known, because it was found in the screen when the feature was sectioned and the east half of the fill removed. The skeleton was in the west part of the pit, largely undisturbed in the sectioning. The only other artifacts from the pit fill were 24 sherds.

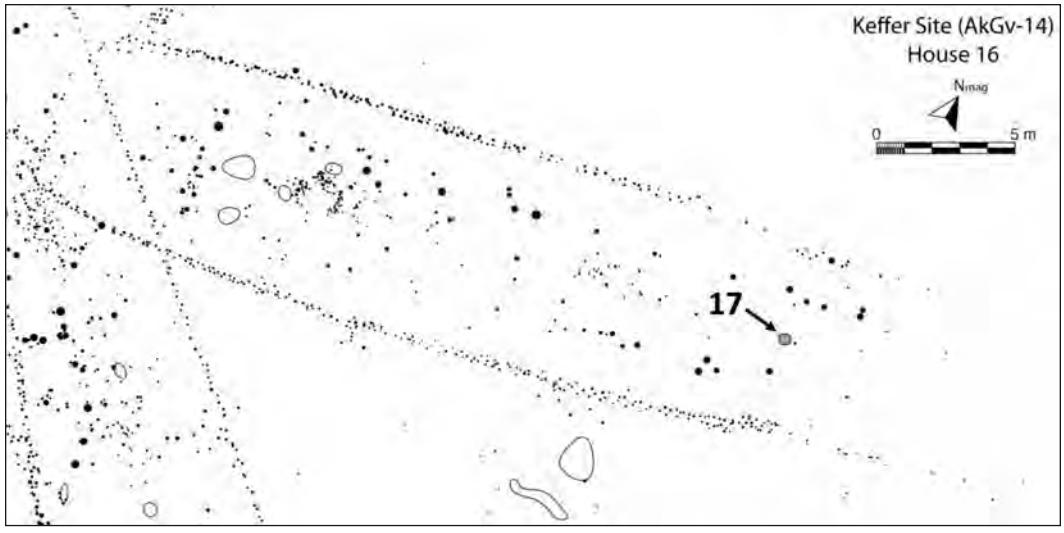

Figure 11. *House 16, with Burial 17.*

Burial 21

B21 was in the western lateral corridor zone of H11, directly across the house from B20 and so in the same dyad compartment (Figure 8). Also a postneonatal infant, B21 was about 1 year old. The body was oriented N-S, extended on its back. The right arm was straight, diverging slightly from the body axis, while the left arm was along the side but slightly bent at the elbow. Both legs were fully extended.

Burial 22

There were two infants side-by-side in this H11 pit (Figure 8). The pit outline and the homogeneity of its fill indicate that this burial was a single event rather than the intrusion of a later burial on an earlier one. B22A, a neonatal infant of about 39 weeks, was in the western half of the feature, while B22B, a fetus of 33 weeks *in utero*, was to its east. The burial feature was at the eastern edge of the central corridor zone.

B22A was on its back, oriented N–S. The arms were extended, with the left arm bent slightly at the elbow, and the right leg was loosely flexed to the right. The position of the left leg, which had been removed in the initial testing of the feature, could not be determined.

The fetus B22B was on its back, oriented slightly off the S–N axis, with the head to the south, basically the opposite of the orientation of B22A. The legs were pulled tightly back over the torso, the lower legs flexed to the left across the torso. The arms were over the legs, the right arm flexed to place the forearm across the body on top of the legs, while the left arm extended diagonally across the body over the right arm. This very compact position must have required some sort of wrapping.

Found 5 cm above the face of B22B, but outside of any wrapping, was a set of articulated fish vertebrae. With the absence of any refuse in the pit fill, it seems likely that these remains were a food offering.

This double burial raises a number of questions. It had been placed in space that was associated with a family cubicle but that was also, to some degree, public. People would have passed through it while walking along the house corridor. It should be noted, however, that most of those people would have been fellow residents of the longhouse, and quite likely kinspeople.

Since they were buried together, the possibility arises that the two individuals were twins who were born together and had both died at birth. This interpretation may seem very unlikely in view of their different levels of dental and long bone development, which suggest a difference of about six weeks in their ages (Table 5; Saunders and

Table 5. *B22 long bone lengths (mm) and age.**

Element	B22A Length	B22A Age	B22B Length	B22B Age
humerus	67	39.38 ± 2.33	53	32.96 ± 2.33
radius	54	39.30 ± 2.29	45	34.04 ± 2.29
ulna	63	39.77 ± 2.20	52	35.20 ± 2.20
femur	77	38.99 ± 2.08	59	33.05 ± 2.08
tibia	66	39.24 ± 2.12	53	33.77 ± 2.12

** age in fetal weeks after Scheuer and Black (2000:Tables 9.5, 9.10, 9.16, 11.5, 11.11)*

Table 6. *Deciduous dental morphology, maxillary first molars.*

Burial	House	Foveal Capsule	Parastyle	Metastyle	Hypocone
22A	11	PL PR	AL AR	AL AR	PL PR
22B	11	– –	– AR	– –	– –
20	11	PL PR	PL PR	AL AR	AL AR
21	11	AL AR	AL AR	AL AR	AL AR
23	11	– AR	– AR	– AR	– AR
6	7	PL AR	PL AR	AL PR	AL AR
10	7	AL AR	AL AR	AL AR	AL AR
11	7	PL AR	– –	AL AR	AL AR
1	1	PL PR	PL PR	AL AR	AL PR
27	20	– –	AL –	– –	AL –
16	12	PL PR	AL AR	AL AR	AL AR
17	16	– PR	– AR	– AR	– AR

A = absent; P = present; L = left; R = right

Table 7. *Deciduous dental morphology, maxillary second molars.*

Burial	House	Foveal Capsule	Parastyle	Metastyle	Carabelli Cusp	Protoconule
22A	11	PL PR	AL AR	AL AR	– –	AL AR
20	11	PL PR	AL AR	– –	– –	AL AR
21	11	PL PR	AL AR	AL AR	PL PR	AL AR
6	7	PL PR	PL PR	AL AR	PL PR	– –
10	7	PL PR	PL PR	– –	– –	AL AR
11	7	PL PR	AL AR	AL AR	PL PR	AL AR
1	1	PL PR	PL PR	AL AR	PL PR	PL PR
2	1	– –	– PR	– AR	– AR	– –
27	20	PL –	– –	– –	– –	– –
28	20	AL –	– –	– –	– –	– –
16	12	PL PR	AL AR	– –	– –	AL AR
17	16	– AR	– PR	– PR	– PR	– AR

A = absent; P = present; L = left; R = right

Spence 1986:Tables 3 and 4). Although it may be possible that genetic or congenital problems stunted the uterine development of B22B, studies of discordant twins indicate that their size differences do not reach the level seen in B22A and 22B (Charlemaine et al. 2000; Storlazzi et al. 1987; see also Saunders 1986:19). Storlazzi et al. (1987:365) found that femur length difference in a series of discordant twins had a mean of 5.5 mm, with a standard deviation of 3.8 mm, well below the 18 mm difference between B22A and 22B (Table 5).

However, this evidence does not necessarily mean that the two were not twins. Both may have been born prematurely together, but B22B died at birth while B22A survived for a few more weeks. B22B was then preserved after death in a tightly wrapped bundle, either because the death of B22A was anticipated or because the bundle was the primary burial, to be retained for later inclusion in the ossuary. When B22A later died, the B22B bundle was retrieved for joint burial with B22A.

Paul and Stojanowski (2015) have demonstrated that the morphology of deciduous teeth can be used to identify close genetic relationships, such as those between siblings (see also Forrest 2010b:115-116; Spence 1987). With that in mind, a number of morphological features were recorded from the deciduous molars of the longhouse subadults (Tables 6–9). The traits selected were those that would be visible in the developing crown in the late fetal and infant stages of life (Butler 1979; Hanihara 1963; see also Hillson 1996:Table 5.2; Sciulli 1998). It was hoped that the relationship between B22A and 22B could be clarified, as well as the genetic links (and, by inference, social bonds) of subadults generally within the longhouses. Traits that were universally present or absent in a particular tooth category were not used. For example, the hypocone was variably expressed in the deciduous maxillary first molars, and is thus included in Table 6 for that tooth, but it was present in all the second molars and so has not been included with that category in Table 7.

The analysis met with limited success. Paul and Stojanowski (2015) were testing for siblings within a large series of mostly unrelated subadults. Distinctions of this sort may be blurred in a sample, such as Keffer, where many of the

Table 8. *Deciduous dental morphology, mandibular first molars.*

Burial	House	Delta Variant	Hypoconulid	Cusp 6	Delta Ridge*
22A	11	AL AR	PL PR	AL AR	AL AR
22B	11	AL AR	PL PR	AL AR	AL AR
20	11	AL AR	PL PR	AL AR	AL PR
21	11	AL AR	PL PR	AL AR	AL AR
23	11	– AR	– PR	– AR	– AR
6	7	AL AR	AL AR	PL PR	AL AR
10	7	AL AR	AL PR	AL AR	AL AR
11	7	AL AR	PL –	PL –	AL AR
1	1	PL PR	AL PR	AL PR	AL AR
2	1	AL AR	– –	– –	AL AR
27	20	– AR	– PR	– AR	– –
28	20	AL AR	PL PR	AL AR	– –
17	16	AL AR	PL PR	PL PR	AL AR
24	18	AL AR	PL PR	AL AR	AL AR

*see Butler (1979:36, Figure 8b[R])

Table 9. *Deciduous dental morphology, mandibular second molars.*

Burial	House	Deflecting Wrinkle	Protostylid	Cusp 6
22A	11	AL AR	PL PR	PL –
20	11	AL –	AL –	AL –
21	11	PL PR	PL PR	AL AR
23	11	– –	– PR	– AR
6	7	PL PR	PL PR	PL PR
10	7	AL AR	PL PR	AL AR
11	7	PL PR	AL AR	PL PR
1	1	– PR	– PR	– PR
2	1	– PR	– PR	– PR
27	20	– AR	– PR	– AR
28	20	AL AR	PL PR	AL AR
16	12	AL –	– –	– –
17	16	AL AR	– –	PL PR
24	18	AL –	PL –	AL –

A = absent; P = present; L = left; R = right

subadults probably had some sort of genetic connection/social relationship with one another, both within and between longhouses. The genetic ties between B22A and 22B could not be fully explored because the underdevelopment and fragility of B22B's teeth allowed for only limited observations. However, those features that could be observed show no differences between B22A and 22B (Tables 6–9), so the possibility that they were twins remains high (Paul and Stojanowski 2015:624). Their burial together may suggest a desire to see them reincarnated as twins.

Burial 23

The mortuary feature for B23, a neonatal infant of about 42 weeks, had been placed in an unusual location, tightly by the inside of the east H11 longhouse wall (Figure 8). The wall postholes passed only 10 cm east of the pit edge. There was a break of nearly 2 m in the wall line at that point, probably a side entry into the house. B23 had been placed at the southern end of this opening. Although B23 was near B22, which was in the central corridor zone, this area was probably not a dyad compartment. There was a cluster of postholes and pits in the central corridor zone at this point, but it is visibly less dense than such clusters elsewhere in the corridor. It may be that there was a family cubicle on the west side of the longhouse here, and that the opposing east side had been left unoccupied because it functioned as an entry. There were two support posts there, one opposite the northern edge of the entry and the other opposite its southern edge. They may have been placed there to offset any structural weakness that may have resulted from the gap in the wall. If this is the case, B23 was not in a family cubicle. This, the body's position, and the feature location against the longhouse wall set B23 apart from the other H11 burials.

B23 was lying on the left side, oriented S–N. The arms and legs were flexed. A groundhog burrow had passed through the burial, jumbling and displacing many of the bones, but the position could still be determined. Surprisingly, the burrow also contained a single bone that was not from B23. It was a right fibula, 47–48 mm long, suggesting an individual in the fetal category, about 30–32 weeks *in utero* (Scheuer and Black 2000:Tables 11.15 and 11.16). It could not have

come from any of the other recognized burials in the village. The rodent burrow could only be traced for some 50 cm beyond the burial, so we cannot say whether the extra fibula came from an unidentified burial, a midden or house pit, or some other context.

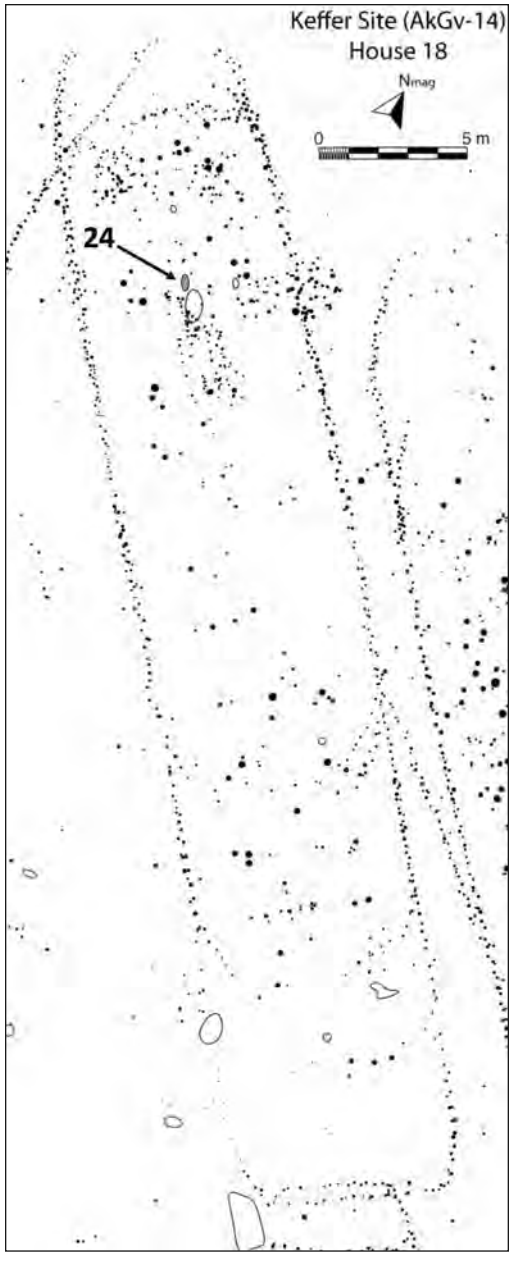

Figure 12. *House 18, with Burial 24.*

Burial 24

B24 was a neonatal infant of 40 weeks, buried in a central zone pit in H18 (Figure 12). The body was extended prone, oriented S–N. The right arm was by the right side. The left humerus diverged slightly from the body axis, and the left forearm had been disturbed. The right leg was extended, and the left leg had been displaced in the initial sectioning of the feature.

Burial 25

B25 was a double burial in an open area, just a few metres west of the eastern double palisade (Figure 8). B18 and B19, in the primary cemetery on the other side of the palisade, were respectively 12 m northeast and 11 m east of B25. B25, then, may also have been part of the primary cemetery, put in place before construction of the palisade.

Cranial features indicate that B25A was a female. Unfortunately there had been considerable plough damage and bone preservation was very poor, so the only age indicator was dental attrition. This attrition suggested a young adult (Melbye 1983), but in the absence of other evidence it is probably safest to simply identify B25A as an adult. B25B was an older child, about 7–9 years of age.

The two individuals had apparently been buried together. B25A was on her right side, oriented SE–NW, in a tightly flexed position. The left leg was pushed out a bit more, to place the left knee 14 cm east of the right knee. The articulated cranium and mandible of B25B were located in front of B25A's torso, below the forearms and in front of the knees, and followed the same orientation as B25A's cranium. Like B25A's, the head of B25B rested on its right side. However, all that remained of B25B were the articulated maxillary and mandibular teeth. The bony parts of the skull were represented only by the right petrous bone and some small particles around the teeth. The postcranial skeleton was completely gone, with not even bone dust remaining. The location of the teeth suggests that part of the body may have rested on top of B25A's left knee, but the body position is unknown.

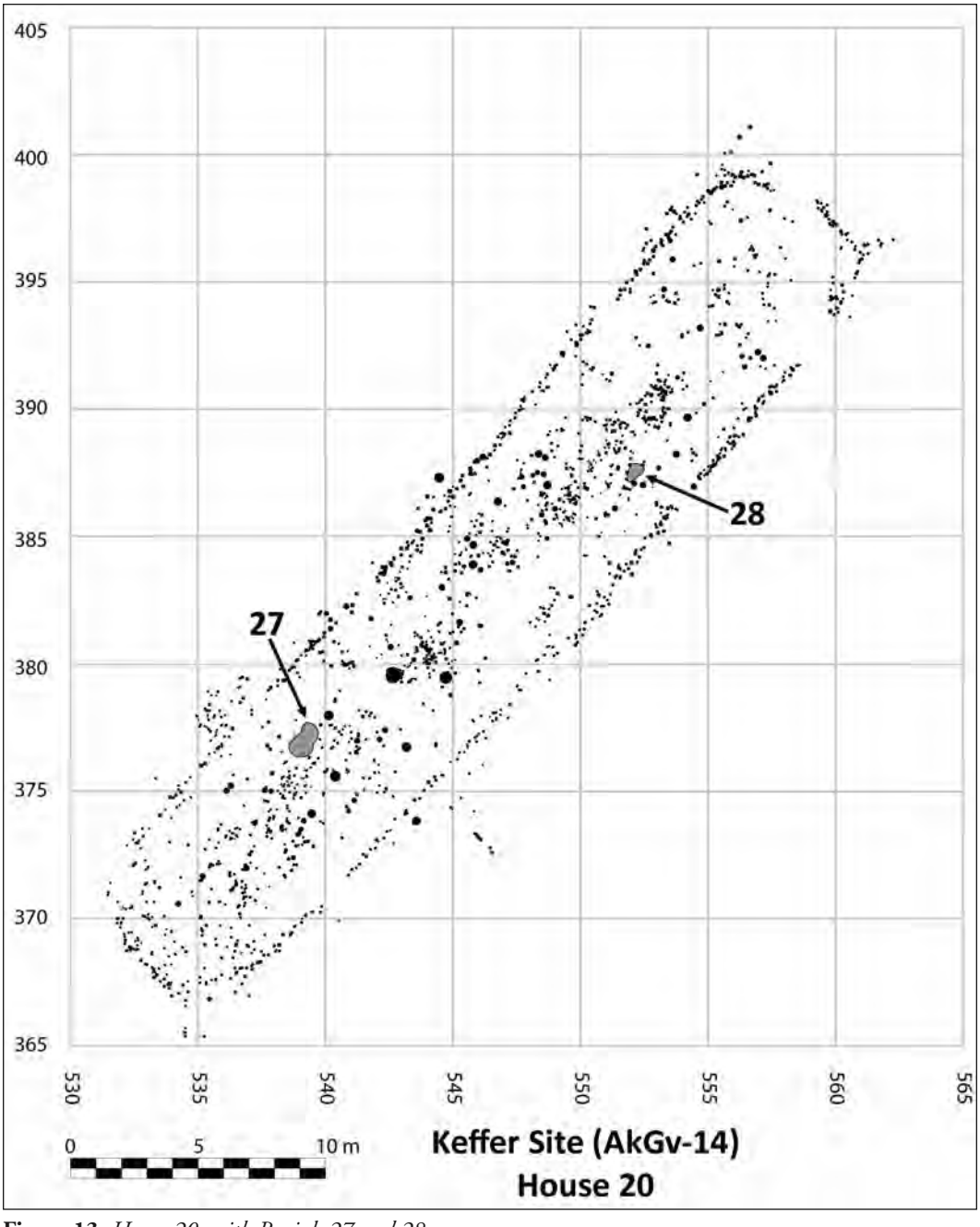

Figure 13. *House 20, with Burials 27 and 28.*

Burial 26

B26 was, at 31 weeks *in utero*, the youngest person buried in the Keffer village (Table 1). The burial was in a pit lined with a few large stones. It was located in an area of overlap between H2 and H3 (Figure 6). If in H3, it would have been a central zone feature in an eastern extension of the house. If in H2, it would have been against the south wall. This seems unlikely, so B26 was probably associated with H3.

Unfortunately, B26 was completely excavated and passed through a screen before it was recognized as human. The material retained in the screen was very incomplete: the right temporal, a piece of parietal, 21 ribs, 11 vertebral arch segments, the long bones of the right arm, the right clavicle, and both femora. Missing are most of the cranium, the mandible, the left arm, both lower legs, the hands, the feet, pelvic elements, the scapulae, a lot of the vertebral column, and more. Many of these, particularly the vertebral elements, hands, and feet, would have been very small or, in some cases, not yet developed. They may well have been overlooked and left in the pit (there was no flotation done of the pit fill) or were not retained in the screen. It is thus likely that B26 was a primary burial, although this treatment cannot be assumed with any certainty. The orientation and position are unknown.

Burial 27

B27 was a neonatal infant of 42 weeks in H20, in the western lateral corridor zone or just under the edge of the western side platform, adjacent to what appears to have been an entry through the west wall of the longhouse (Figure 13). The body was on its right side, oriented NW–SE, and loosely flexed. The tibiae, femora, and humeri all show extensive layers of woven bone, indicating a case of infantile cortical hyperostosis (Caffey's Disease). This condition in infants is usually not fatal and soon disappears (Ortner and Putschar 1981:294; Scheuer and Black 2000:24). It may be caused by excessively rapid production of new bone or by poor binding of the periosteum to the cortex. Although it is rarely fatal, the condition may nevertheless have been implicated in the death of B27.

Burial 28

B28, also in H20, was a young child of about 3 years. The burial was in the eastern lateral corridor zone, at the edge of a large ring of postholes in the central zone (Figure 13). The body rested on its left side, tightly flexed, and oriented NE–SW. An unusual feature of B28 is the fusion, from crown to root apex, of the two deciduous mandibular left incisors. It is a case of fusion, not germination. This anomaly has not been noted in any of the other Keffer burials (but see below for the Hidden Spring site).

The Primary Cemetery

An area that may be referred to as a primary cemetery, where primary burials were placed as people died, to be kept until their exhumation for the final ossuary burial, was found just outside the eastern double palisade of the village (Figure 8). It consisted of 10 pits and a set of postholes, distributed over an area of about 30 m north–south × 11 m east–west. Its eastern and southern limits were established by excavation. Its northern limit was not clear. The cemetery may have extended another 30–40 m in that direction. B9 had been placed in a gap in the palisade 18 m northwest of the nearest identified cemetery feature (Figure 8). However, if the cemetery extended further north, it may have included B9. Unfortunately, the virtually complete removal of B9 from its context during topsoil clearing makes it difficult to assess the burial.

The westernmost feature (B18) of the cemetery was only 2 m beyond the eastern palisade. Although B25 may also have been part of the cemetery, it was on the village side of the palisade and was the only burial in that area. If part of the cemetery, it may have been an early burial, placed there before the construction of the double palisade.

Within the exposed area of the cemetery there were 10 pits. Two of these held unexhumed primary burials (B18 and B19). The other eight (P1–8) either held small quantities of bone (P1–3, 8) or none at all (P4–7). A set of six postholes, in three pairs, indicates a structure about 1.5 × 6.0 m, perhaps some sort of raised platform or box

suggestive of, but larger than, those in the French description of a historic period Wendat primary cemetery (Trigger 1976:52-53).

Of the four pits with only a few bones or teeth, P1 had a couple of fragments of a human adult occipital bone. P2 included a deciduous mandibular right canine tooth from a child of 3 years or more, an adult hand phalanx, and one unidentifiable fragment, indicating the former presence in the grave of an adult and a subadult. P3 produced a few scattered permanent teeth. P8 had only one fragment of adult long bone, either femur or tibia. It seems likely that the four features with no human material (P4–7) were primary graves from which the bodies had been fully exhumed. They may have been individuals who had died near the time of ossuary creation, and so had not decomposed sufficiently to leave elements behind when they were exhumed.

Even if the cemetery continued to the north, it would not have been very large, probably including no more than 30 individuals. Its eastern extent was severely constrained by a rise in the land and a change to heavy clay from the sandy soil near the village. The cemetery could not possibly have held more than a fraction of the village dead, possibly a longhouse or kin-based group, such as a lineage or clan segment. This means, then, that there must have been other primary cemetery areas in the vicinity of the village (see also Robertson 2004:116).

Cemetery areas have been found at other sites in the region. The fourteenth century Hutchinson site, on a tributary of the Rouge River (Figure 1), seems to have been a specialized mortuary site (Robertson 2004). It consisted of two longhouses, two exterior and one interior sweat lodges, a few exhumed graves, and the excluded elements from the preparation of 9–10 individuals for secondary burial. The remnants indicate a wide age range and include both sexes. Some 80 m distant and on the far side of a creek, three unexhumed primary burials (2 adults, 1 subadult) were found. Hutchinson may have been the primary burial area for a segment of a nearby village, yet to be identified.

Sixteen individuals were removed from a sandy knoll 100 m outside the Mackenzie-Woodbridge site, an early sixteenth-century village on the Humber River (Figure 1) (Saunders 1986). Unfortunately, most of them were excavated without archaeological supervision, so details on burial context are sparse. Most, however, appear to have been primary or secondary burials that had not been exhumed for a final ossuary burial. Both sexes and most age categories were represented. The actual size of the burial area is unknown.

A third extra-village burial area was discovered at the Mantle site, an early sixteenth-century village on a tributary of West Duffins Creek (Figure 1) (Birch and Williamson 2013:153-155). The cemetery was 40 m outside the village and consisted of 37 features with 34 individuals, most of them primary burials. Both males and females were represented, but there were no subadults. Birch and Williamson (2013:155) believe that these burials were never intended for inclusion in an ossuary.

Unlike the Keffer cemetery, these burial areas were at some distance from their donor communities. At 40 m, the Mantle area was closest to its village. None of them was large enough to have included all the village dead. There must have been other such areas associated with the villages, but, as Robertson (2004:116) notes, they would be archaeologically invisible. Presumably several such areas were scattered around the Keffer site, but far enough away that they would not have been discovered in the course of excavations focussed on the village itself.

The Mackenzie-Woodbridge and Mantle primary cemeteries, unlike that of Keffer, do not seem to have included exhumed burials. They were apparently reserved for individuals who were not to be included in the ossuary. Some may have been among the categories of people who, by the nature of their deaths, were excluded from the ossuary (Birch and Williamson 2013:155). However, there is another possibility. Both of these early sixteenth century communities were in a time of village coalescence (Williamson 2014). We think it possible the primary cemeteries may have been used by groups who had recently joined the village and either had no prior tradition of ossuary burial or still had a liminal status in the community and were not yet accepted for inclusion in the ossuary.

Non-burial Bone

Beyond the deliberate burials described above, there were 1,237 human skeletal and dental elements and fragments recovered from various other contexts across the village: 1,072 from middens and 165 from houses (Rainey 2002). Birch and Williamson (2013; Williamson 2007) believe that much of this "scattered" or "midden" bone is derived from the execution of war captives. Another major source would have been skeletal elements that were overlooked during the exhumation of primary burials or held back during the preparation of primary burials for secondary reburial in the ossuary. These lesser elements may have been left behind in the primary burial feature, placed in a separate pit, or deposited in a midden. Clusters of these elements have been referred to as "sorted deposits" (Spence 2011).

Less likely sources include primary burials whose location had been forgotten and then disturbed by later activities, individuals who had died by freezing or drowning, and those who had been executed for treason or witchcraft. These latter cases led to alternative mortuary tracks among the seventeenth-century Wendat (Tooker 1964:132; Trigger 1976:52). The corpses of those who froze or drowned were defleshed, and their skeletons were deposited in a "ditch" (perhaps referring to an open grave). Witches were beheaded and/or burned. Although some elements from these situations may have eventually found their way into house pits or middens, it is doubtful that they would account for more than a small proportion of the scattered bone. In many cases, their remains would probably mimic primary or secondary burials.

The two main kinds of scattered bone, then, would be the remains of executed captives and elements that had been sorted out from primary burials or overlooked in their exhumation. It may be difficult to distinguish between these two sources. Both elements sorted out from exhumed burials and remnants of captives could have ended up in either the middens or the houses. One basis for distinction is the age and sex of the individual. The victims of torture and execution were generally adult men. Women and especially child captives were usually spared and adopted (Tooker 1964:30). The evidence of perimortem trauma will also be important in identifying captive, witch, and other executions.

The skeletal elements usually preserved for inclusion in secondary burials were the cranium, mandible, and long bones of the arms and legs. Beyond those there was considerable variability, perhaps dependent on family wishes (Creese 2016:354) or simply on how tenaciously other elements were still attached by soft tissues, rather than on any particular significance assigned to them. The appearance of adult crania, mandibles, and long bones in non-burial contexts, such as middens, then, suggests that they were from executed captives, or perhaps from villagers who had been excluded from the main mortuary track because of actions against the community, such as treason. Conversely, clusters of lesser elements, such as bones of the hands and feet, ribs, vertebrae, and others, would more likely be items not retained for inclusion in the ossuary.

However, the preparation of subadults for secondary burial was often less structured. Their long bones were smaller and less recognizable, so they may at times have been overlooked or lost. When reduced to bone by decomposition, the crania were likely to separate along sutures, and were more easily fragmented by taphonomic forces, so some segments may not have been collected for reburial. Thus, the appearance of some major subadult skeletal elements in non-burial contexts is not compelling evidence that they came from captives.

In sum, we have no absolute criteria for distinguishing among the scattered bones, on the one hand, those that were sorted by-products of the mortuary procedures followed for most community members and, on the other hand, those that represent some alternative and often hostile treatment, usually of war captives. Nevertheless, the characteristics outlined above will allow us to weigh the likelihood of one source over the other. For example, Midden 77 (M77) produced adult cranial and mandibular fragments, probably male, with percussion impact sites and long bones with perimortem fractures, including a femur with three projectile point punctures

Table 10. *Scattered bone, middens and houses.*

	Middens		Houses	
Elements	Adults	Subadults	Adults	Subadults
cranial	317 (49.6%)	26 (46.4%)	15 (19.5%)	9 (34.6%)
long bone	49 (7.7%)	7 (12.5%)	1 (1.2%)	5 (19.2%)
hand and foot	78 (12.2%)	4 (7.1%)	23 (28.0%)	3 (11.5%)
trauma	20 (3.1%)	0	2 (2.4%)	0
green bone fractures	29 (4.5%)	2 (3.6%)	3 (3.7%)	0
total fragments	639 (100.0%)	56 (100.0%)	82 (100.0%)	26 (100.0%)

(Rainey 2002:222-223). This collection probably represents an executed war captive, to judge by the age and sex of the individual, the midden context, the presence of major elements normally included in secondary burials, and the evidence of deliberately inflicted perimortem trauma. Despite the fact that captives were often "adopted" into Wendat families before their torture and death (Tooker 1964:33, 35-36), contexts of this sort will not be treated as part of the Wendat mortuary programme.

As noted, most (86.7 percent) of the "scattered bone" is from the middens. Also, most of it is indeed scattered, with very few discrete and recognizable clusters. There had obviously been some movement of pieces after their original deposition. Some of this was due to animal transport; 9.4 percent of the midden bone and 3.7 percent of the house bone show evidence of animal gnawing. Ploughing and topsoil removal further disturbed deposits in all parts of the site. In the case of one femur showing animal scavenging, conjoining fragments were found 21 m apart (Rainey 2002:153). Nevertheless, for the most part conjoining fragments were in close proximity.

Some patterns are visible in the scattered bone. Only 11.4 percent of the adult bone, but 31.7 percent of the subadult bone, comes from longhouse contexts. In the adult assemblage, cranial and long bone fragments form a considerably higher proportion in the middens than in the houses, while the reverse is true for hand and foot elements (Table 10). This pattern suggests that material sorted from adult burials prior to reburial may be more likely to appear in the houses, while the remains of executed captives were more likely to have been deposited in the middens. This interpretation is supported by the distribution of evidence of trauma, represented by percussion pits, hacking or chopping lesions, and projectile point punctures, which occur in 20 midden but only 2 house elements (3.1 vs. 2.4 percent). Green bone fractures, done while the bone still retains its plasticity, may also be indications of perimortem trauma, although in some cases the trauma may have been accidental rather than deliberately inflicted, or even postmortem. Fractures of this sort are present in 4.5 percent of the adult midden bone and in 3.7 percent of the adult house bone (Table 10).

In the subadult assemblage, cranial fragments form a slightly higher proportion in the middens, while long bone and hand/foot elements are relatively more common in the houses (Table 10). Green bone fractures are present on two subadult midden bones (3.6 percent), but do not occur among the subadult house bones.

In relative terms, then, subadult elements are more likely than adult elements to occur in the houses, and adult elements are more likely to occur in the middens. The adult elements in the middens are more likely than those in the houses to be the sort of elements that would normally have been retained for the ossuary, and they show somewhat higher levels of trauma and green bone fractures. Frontal bone morphology indicates the presence of 8 males and 5 females in the middens, with evidence of trauma limited to the males. Many of the midden adults, then, may have been executed war captives, although some could have

died of other causes. One M57 sacrum had two deep slashes on its ventral surface, raising the possibility that this individual was an eviscerated victim of drowning or freezing (Rainey 2002:141-142).

In contrast, the smaller collection of adult bone from the houses may, for the most part, represent elements sorted out during preparation for secondary burial. The relatively high proportion of hand and foot elements would seem to support this idea. Nevertheless, long bone and cranial fragments were also present, and two fragments show trauma, so some executed captives may also be represented.

The smaller subadult assemblage is equally difficult to interpret, but the higher proportion (compared with the adult bone) in the houses and the absence of trauma support the later statements of the French observers that subadult captives were adopted, not killed. However, child captives who could not be carried back to Huronia were killed where captured and their heads or scalps were then brought back (Tooker 1964:30). It is possible that these were the sources for the three Keffer discs cut from subadult parietal bones (Rainey 2002:137, 139). Such discs are generally considered to be from captives (Jenkins 2016; Williamson 2007:203-209). However, none of the Keffer cranial bone, whether buried or scattered, shows evidence of disc removal. Without some evidence of their source, it is difficult to say whether parietal discs were trophies, amulets, heirlooms, rattles, or some combination of these (Ramsden 2013:222-223).

There is a total MNI of 20 for the scattered bone (Rainey 2002:165), but the reliability of this count is limited by the wide distribution and fragmented nature of the assemblage. One particular problem is the difficulty of determining the balance between executed captives and sorted deposits in the remains, although it appears that the proportion of captives is higher in the middens than in the houses. Much of the house material may be from the preparation of bodies for secondary burial. Still, the small quantity of human bone fragments from the houses (n=108) suggests that, even if most of it is from sorting, much of the preparation for secondary (ossuary) burial probably took place elsewhere, perhaps in the primary cemeteries outside the village.

For the most part, the contextual data on the scattered bone is of limited help. One rare exception is a cluster of skeletal elements initially identified as Burial 12. It was in a basal midden remnant that had originally been part of M52. Elements in this cluster were all disarticulated. They include parts of the maxilla; the sphenoid; most of the left ulna and radius, the latter with a green bone spiral fracture; fragments of at least 3 ribs; sternum fragments; the hyoid; 4 hand elements; and parts of a thoracic vertebra (Rainey 2002:185-186). In addition to this cluster, there are 29 adult fragments from M52. These include pieces of the cranial vault, mandible, humerus, tibia, vertebrae, and hand. They may or may not be from the same individual as "Burial" 12. In either case, the "burial" is more likely the remains of a captive than elements from secondary burial preparation.

The Bones in the House 4 Footing/Wall Trench

A number of skeletal elements were found in a footing trench for the west wall of H4 (Figure 7). They were initially designated Burial 14. The bones were scattered along a 1.7 m stretch of the trench (Rainey 2002:105-106; Spence 1987). Two individuals are represented, a subadult (14A) of about 3 years to judge by dental development, and an adult (14B). There were no articulations, and none of the bones bore cutmarks or evidence of perimortem trauma.

The bones of the child were clustered together at the northern end of the deposit. Present were the anterior part of the cranium, consisting of most of the frontal bone and the antero-medial parts of both parietals; the right malar; the vomer; the right maxilla with both deciduous molars (the other teeth had been lost postmortem and were not in the trench); the left ilium and pubis; the left humerus and tibia; both fibulae; the axis neural arch; 4 thoracic and 1 lumbar vertebrae; and 4 left and 4 right ribs. The calvarial segment rested upside down, with the axis arch nestled inside it. The facial elements were separated from the calvarial segment and each other by a few

centimetres. The tibia was resting upright in a posthole in the bottom of the trench, perhaps having been used as a wedge for the post. The whole cluster of 14A's bones extended only 32 cm along the trench.

The bones of the adult, 14B, were widely dispersed through the next 138 cm of trench. They were a small fragment of femoral shaft; parts of 1 left and 1 right ribs; the right first metacarpal; left metatarsals 1–3; right metatarsals 1, 4–5; a sesamoid bone; left cuneiforms 1 and 3; and 2 proximal and 1 middle foot phalanges.

A number of bones were also recovered from the interior of H4. Two individuals were represented, a child of 1–3 years and an adult (Rainey 2002:104-105, 225-227). Element duplications show that the H4 adult and 14B are different individuals. It was not possible to determine whether or not the H4 subadult and 14A are the same person.

The elements of 14B are what would be expected from a sorted deposit (e.g., elements and fragments excluded during the preparation of an exhumed primary burial). The same is probably true for 14A, the subadult, despite the presence of some major skeletal elements. Missing are the posterior half of the calvarium; the cranial base; all the bones from the left side of the face; the mandible; most of the teeth; both femora, patellae, radii, and ulnae; the right humerus and tibia; both scapulae and clavicles; the sternum, manubrium, and sacrum; most ribs and vertebrae; both ischia and the right ilium and pubis; and all the bones of the hands and feet. Although some of these may have been left in the primary burial feature, there are enough missing major elements to conclude that they were reinterred elsewhere as a secondary burial, while those that were present in the wall trench had simply been left there during the preparation for secondary burial.

There were no subadult secondary burials in the Keffer site, so the missing bones of B14A were not reburied within the village. The only definite adult secondary burial was B13, in H8. It was 20 m west of the wall trench, and element comparisons indicate that it is not the same person as B14B. B9, 50 m southeast of B14B, may also have been a secondary burial, but it was too badly disturbed to be sure. There was not enough material recovered from it to compare with B14B.

All things considered, it seems that B14A and B14B were sorted deposits. Their secondary burials would presumably have been in the village ossuary. However, there is one difficulty with this conclusion. The two sorted deposits were placed in the wall trench at the start of construction of H4, and H4 was built during an expansion of the village. This expansion would have been well before the actual abandonment of the village, the event usually thought to trigger the Feast of the Dead and ossuary burial. Perhaps, then, there were two episodes of ossuary burial over the lifespan of the village. The Feast and ossuary burial were very important mechanisms of social integration, presenting and reinforcing solidarity among different segments of the society, between different villages, and even between the Wendat and the French (Creese 2016:367; Trigger 1976:90, 426-427, 518-520). It may be that a Feast was held to confirm and celebrate the incorporation of the newcomers. This Feast would also have served as the village abandonment Feast of the newcomers. On the other hand, it is also possible that the people of H4 brought two recently deceased residents with them when they moved to Keffer, prepared them for secondary burial while their longhouse was under construction, and then either placed them in a small secondary burial outside the village or set them aside for later inclusion in the Keffer ossuary.

The Keffer Ossuary

The Keffer ossuary (AkGv-15) is located some 250 m southwest of the village. The collection made by Boyle from the ossuary is stored in the Royal Ontario Museum. It has been examined by Molto (1983), Larocque (1986), and also directly by Spence. The series originally consisted of 55 adult crania (however, crania nos. 55 and 56 of the series are actually not from Keffer). There were also 20 long bones. However, 5 long bones and 6 crania are now missing, probably having been loaned or presented to friends of Boyle and to other institutions. Of the 49 remaining crania, only 3 have mandibles, and many are missing the

facial elements. Boyle (1889:20) reported that two "spadesmen" helped with his excavation, which may explain the absence of facial parts. The number of individuals originally included in the ossuary is not known. Boyle's colleague Rowland Orr estimated that there were about 1,000, but he later amended this total to a minimum of 800 (Boyle 1908:16).

The calculation of the number of dead in the ossuary, in the absence of any further excavation there, must rely on an estimation of the number of people living in the village. Finlayson et al. (1987) estimate that over its existence Keffer grew from an initial population of 192 to one of 744 individuals, but they did not elaborate on the methods underlying their calculations. We have estimated the village's population in each of the eight stages of its development by measuring house lengths and then determining the number of families in each. The method relies on a number of assumptions, but at least it is tailored to this particular site, rather than invoking a more general rule of thumb, such as number of individuals per hectare.

Most houses could be measured, but in some the length was obscured by overlaps or other problems and therefore had to be estimated. The end cubicles, which show no evidence of residence, were excluded. Also excluded were the H7 Burial Area and the B23 area of H11. Each house length included any expansions (or contractions) made over its history, even though these may have involved changes in the number of residents from one stage to another.

The number of families per house was based on the clusters of posts and other features along the length of the house (see Creese 2011:284, 300). In eight of the Keffer houses, these clusters are clearly visible, spaced on average 6.3 m apart (with a range of 4.9–7.5 m). This average spacing was used to calculate the number of dyad compartments in those houses where feature distributions were not clear. Each dyad compartment was occupied by two nuclear families, one on each side of the corridor (Creese 2009). Following Warrick (2008:145), the average nuclear family is estimated at five individuals.

If all of these assumptions can be accepted, we can arrive at an estimate of the village's population in each of the eight stages identified by Smith (2014). The population in the first stage, the initial village of six longhouses, is calculated at 272 individuals. In the final stage, with 15 longhouses, it was 744 individuals. These figures are not very different from those of Finlayson et al. (1987). In fact, our numbers for the final stage are identical, although the Finlayson et al. number does not include the two longhouses excavated in 1988.

Converting these population estimates into estimates of the number of deaths requires a few more assumptions. The length of the village's occupation is assumed to be about 25 years (c. A.D. 1475–1500), and each stage is assumed to be of equal duration, about three years long. The frequency of deaths is assumed to have remained stable over time and among the various segments of the community. Finally, a crude death rate of 40/1000/year is assumed. This rate is the one calculated by Pfeiffer (1983, 1986) for the Uxbridge ossuary, another Wendat site. With two radiocarbon dates of A.D. 1480, it was generally contemporaneous with Keffer (Pfeiffer 2015). There were a minimum of 457 people in the Uxbridge ossuary (Pfeiffer 1983).

When the death estimates for each stage are combined, the total number of deaths over the course of Keffer's existence comes to 540. This total is rather less than the minimum of 800 estimated by Boyle and Orr for the Keffer ossuary, but, despite the numerous assumptions underlying it, is probably closer to the truth. It may, in fact, be too high for the ossuary if speculation about a second ossuary were to be substantiated. One plausible candidate for a second ossuary would be the little-known Downey ossuary, located about 500 m west of the village, on the other side of the Don River (D.R. Poulton and Associates 2000).

Discussion

Archaeologists working on Wendat sites have the advantage of a number of accounts by seventeenth-century French observers, particularly Champlain, Sagard, and the Jesuits. However, their observations are filtered through their own

cultural and religious biases, and in this case through the lenses of two languages (Forrest 2010b:101-102). There is another problem with an uncritical reliance on their accounts. They often present what were encounters with specific Wendat individuals and situations, rather than a broad analysis of Wendat culture. Their commentary may hold true for certain Wendat communities at a particular point in time, yet not for contemporaneous communities elsewhere in Huronia or in earlier periods (Creese 2016:355). For example, the practice of burying infants in places that would facilitate their reincarnation into the wombs of living kinswomen, recorded by some French observers (Thwaites 1896-1901:10:273, 15:183) and interpreted to include longhouse burial (Kapches 1976; Steckley 1986), was apparently followed erratically. There were very few or no such burials at Warminster, Ball, and Mantle, but several at Keffer and Draper (Birch and Williamson 2013; Forrest 2010b).

The key difficulty in interpreting this sort of variation lies in the distinction between fundamental changes in the mortuary programme and fluctuations in the conditions that triggered certain mortuary tracks, or differences in the practices by which they were expressed (Spence 1994). Also, practice may vary through the intrusion of agency (Dobres and Robb 2000), and even through accidents, such as misinterpretation or incomplete understanding when the practice is encountered and copied beyond its original context (Cowgill 2000:53; Ramsden 1990:168-169). For example, it may be that some communities, such as Mantle, simply did not have a belief in infant reincarnation. Alternatively, there may not have been any infant deaths there (extremely unlikely), infants may have been buried on the paths to their matriclan fields (Steckley 1986:7), or there may have been enough pressure on local resources to discourage attempts at reincarnation. The best approach to this sort of problem may be to identify long-standing core mortuary beliefs and practices, such as ossuary burial (Williamson and Steiss 2003), the reincarnation of infants (Forrest 2010b; Kapches 1976), and the exclusion of those who died through violence from the community of the dead (Forrest 2010b:114-115; Spence and Wilson 2015), and to then track how their expression varied over time and space. An effort of that sort is beyond the scope of this article. However, the Keffer mortuary data can be added to the accumulating body of evidence required to explore these questions (e.g., Fitzgerald 1979; Forrest 2010b; Kapches 1976; Knight and Melbye 1983; Ramsden and Saunders 1986; Williamson 1978).

Position and Orientation

There is little consistency to the positions and orientations of the Keffer burials. Although most were flexed, they could be on either their left or their right side. Orientations were highly variable and show no consistent correlation with the long axis of the house or other features in the vicinity. The one exception occurs with two of the H11 burials. B20 and B21 (both PI) and B22A (NI) were extended supine, a clear difference from the other infant burials, and were oriented parallel to the long axis of the house, with their heads to the north. B22B, the fetus sharing the burial feature with B22A, was flexed supine and probably tightly wrapped. Its orientation was the opposite of that of the others, but its placement with B22A makes the significance of this difference unclear. The other exception to the H11 pattern was B23 (NI), flexed on the left side and oriented with the head to the south. It was also in an unusual location, beside the house wall, at a side entry into the house.

It was noted above that B22A and B22B were very similar in dental morphology and may be twins. However, when all of the extended head-to-north H11 infants (B20, B21, B22A) are examined, there is a considerable degree of diversity, especially in dM^1 and dM_2 (Tables 6–9). B20 and B21, although in the same dyad compartment, have a number of differences. The same is true of the B22 infants and B23. Paul and Stojanowski (2015:624-625) say that subadults with very similar dental morphology usually, but not always, have very close biological relationships, while those with dissimilar morphology would not be closely related. However, their study was focussed on sibling relationships and could not consider slightly more distant kin ties, such as

cousins. The Keffer dental morphology indicates that, with the likely exception of B22A and 22B, the H11 infants were not siblings, but the question of other kin relationships remains open.

Location and Age

Although the Jesuits reported that infants considered for reincarnation were only 2 months or less (Tooker 1964:132), the Keffer evidence suggests that all infants and even young children up to 4–5 years could be buried with that intent (Tables 4 and 11). The same is true at the Draper site (Figure 1) (Forrest 2010b). One Keffer child of about 4 years (B6) was in the H7 Burial Area, but another of 4–5 years (B2) was under a side platform. Individual B14A, about 3 years old, was probably a sorted deposit, so children as young as three were apparently considered appropriate for ossuary burial. Two older children, 7 or more years of age, were buried with adults beyond the houses (B19B, B25B). These data suggest that sometime in the 3–7 year span, children were considered too old to be candidates for reincarnation but old enough to make the journey to the village of the dead in the west.

However, we can be sure that more than 13 infants and 3 young children would have died over the course of Keffer's occupation (see, for example,

Table 11. *Longhouse burial locations.*

Burial	House	Age*	Location	Comments
1	1	PI	central corridor zone	
2	1	YC	side platform	same dyad compartment as B1
3	7	MA	H7 Burial Area	
4	3	YA	end cubicle	
5	7	YA	H7 Burial Area	
6	7	YC	H7 Burial Area	
10	7	NI	central corridor zone	
11	7	YC	side platform	same dyad compartment as B10
13	8	MA	side platform	
15	2/3	PI	side platform or lateral corridor zone (H2)	or central corridor zone (H3)
16	12	NI	side platform or lateral corridor zone	
17	16	NI	central corridor zone	
20	11	PI	lateral corridor zone	
21	11	PI	lateral corridor zone	same dyad compartment as B20
22A	11	NI	central corridor zone	
22B	11	FI	central corridor zone	same pit as B22A
23	11	NI	by side entry	near B22A–B
24	18	NI	central corridor zone	
26	3	FI	central corridor zone	
27	20	NI	lateral corridor zone	
28	20	YC	lateral corridor zone	

*see Table 4 for age key.

Merrett 2003:176-177). They were probably reinterred in the ossuary. The contemporaneous Uxbridge ossuary held 52 infants (Pfeiffer 1986:25). The decision on whether to commit a subadult to the ossuary or to attempt a reincarnation may have been based on a variety of factors that touched on the nuclear family, such as the quantity and reliability of resources at their disposal, and the health and wishes of the potential mother (Creese 2016:354).

There are three particularly striking anomalies in the Keffer pattern. B7 (NI) and B8 (FI) were buried on the eastern edge of the village, between the two rows of the double palisade (Figure 7). No women would have been passing by there, so the location seems to have been deliberately selected to prevent even the possibility of reincarnation and, at the same time, to prevent exhumation for inclusion in the ossuary. Also, since the palisade probably had a symbolic as well as physical role, demarcating inside from outside (Ramsden 1990), the placement of the infants in the small area between the palisades may have prevented their souls from interfering with the living, either inside or outside the village, locking these souls forever in this liminal space. This treatment seems excessive for an infant who may have been born of a visitor or one whose rebirth may have put a strain on the family's resources. It suggests that these infants, or their souls, were considered dangerous or polluted. It may also be that the infants were deformed; no skeletal evidence of deformity was observed, but the preservation was not good.

The situation also raises the question of infanticide. The French observers make no mention of infanticide among the Wendat, and there is no evidence of trauma in the skeletons. However, infanticide usually involves "gentler" methods, such as smothering, especially when done by family members (Scrimshaw 1984:448). There are a variety of reasons in various societies for infanticide: the death of the mother, conception through an adulterous relationship, the absence of male support, limited family resources, concern for the survival of a slightly older sibling, and more (Daly and Wilson 1984; Scrimshaw 1984). Most of these would not seem to require the rather drastic measures seen with B7 and B8. However, some situations may warrant them. Birth to a female captive who is executed, conception through an incestuous relationship, and severe physical defects are among the possibilities. Infanticide cannot be proven with the available evidence, but the location of these two burials does indicate some very serious concerns about the nature and legitimacy of their births, as well as a desire to isolate their souls.

The third anomalous burial is B13, the secondary burial of an adult male beneath the side platform of a family cubicle in H8 (Figure 9). He may have died in a manner that excluded him from the ossuary. One possibility is a violent death: a war casualty, suicide, or murder by a fellow villager (Trigger 1976:52). Burial 6 of the Draper site was the secondary burial in a longhouse of a man who had suffered a violent death (Forrest 2010b:106-108, 114-115). There is no evidence of trauma on the remaining bones of B13, but most of the upper part of the cranium and a number of other bones had been destroyed or removed during topsoil clearing, in addition to those excluded from the secondary burial.

The death of a Wendat warrior in combat supposedly led to the exclusion of his bones from the ossuary and his soul from the village of the dead (Tooker 1964:132). This belief, it seems, would have hindered the conduct of warfare and the defence of the village. It would tempt a warrior to avoid combat if there was a good chance that he would be killed. However, Wendat warriors seem to have been eager enough to go to war, so perhaps there was an escape clause of some sort, a way to avoid the unpleasant afterlife that they would presumably have faced if killed. Von Gernet (1994:45-46) suggests that the Wendat believed that a deceased adult's "body-sken" (the soul that resided in the bones), or at least some of his characteristics, could be reborn in a child. They took as proof of this the occasional resemblance between living and dead individuals. The placement of B13 in a Keffer longhouse, and B6 in a Draper longhouse, may have been attempts to secure their rebirth in newborns. B13 may be an example of agency (Dobres and Robb 2000). A grieving kinswoman may have tweaked a vaguely formulated idea, that some aspects of a

dead person's character could be reborn in or transmitted to a living person (von Gernet 1994), into a belief that the dead person could be reincarnated the same way that infants could.

The French stated that the body of a man killed in war was buried quickly, with a small structure erected over the grave, and not exhumed for the ossuary (Trigger 1976:52). However, as noted above, the Keffer and Draper evidence suggests that they may be exhumed for a longhouse reburial. Both Keffer B13 and Draper B6 are classified as secondary burials. Some skeletal elements of Draper B6 bear cutmarks, indicating that the body had been defleshed and dismembered. There are no cutmarks on the remaining bones of B13, so his reduction to a skeletal state may have occurred through decomposition. The bones of a deer mouse (Peromyscus maniculatus) were found inside the cranium, and there has been rodent gnawing on the right occipital condyle, suggesting that the original burial of B13 may have been in an above-ground tomb or scaffold.

There were four burials in Keffer longhouses that were not associated with residential space, one subadult (B6) and three adults (B3–5). The three adults are the only adults that were given primary and final burial in the longhouses. B4, a young adult woman, was in the eastern end cubicle of H3, just inside the curving end wall (Figure 6). B3, B5, and B6 were all in the H7 Burial Area (Figure 5). B3, a middle adult man, was buried just inside the southern part of the curving end wall of the original H7, in a location much like that of B4. The burial pit may even intrude slightly into the wall line. B6, a child of about 4 years, was in a similar location, either in or just inside the north part of the same end wall. B3 and B6, then, may either have been buried in the east end cubicle of H7, before the house's extension to the east, or they may have died somewhat later and been placed in the open space left there when H7 was expanded and its original end wall dismantled. B5, a young adult man, was buried beyond the original end cubicle, and would have been placed in the H7 Burial Area after the house's extension. The similarity in location of B4 of H3 and B3 and B6 of H7 suggest a practice of burial in end cubicles, tightly against their end walls. With two burials already in this location in H7, the occupants of H7 may have respected the practice and left an unoccupied area there when they extended the house, later adding B5.

Most of the house burials were associated with family cubicles and dyad compartments. B13 was the only adult buried in such a context, and there is reason to believe that the H8 residents hoped he would be reincarnated in a H8 infant. In contrast, B3–6 were placed in contexts that were not associated with particular families. If the objective of their burial was rebirth, it was a broadly cast net, and no one family was eager to take on the responsibility. They were in spaces that house residents would have passed by frequently, and non-residents less frequently, but nobody would have stayed there for any length of time.

Their burial in the houses may not have been intended to facilitate their rebirth. Their exclusion from the ossuary could have been for a variety of reasons: death by freezing or drowning, suicide, execution for treason or witchcraft, or others. Perhaps they had come from another community but died before they had been fully accepted into the Keffer community. Clearly they had some connection with the residents of the longhouse in which they were buried, but not enough to encourage their rebirth to particular house families.

The only other adult burials were in the open (Figure 8). Two of them (B18, B19) were definitely and two of them (B9, B25) were possibly associated with the primary cemetery. Little can be said about B9 because of its destruction during topsoil removal and because of the uncertainty about the northern extent of the primary cemetery. B25 may have been an outlier of the primary cemetery, placed just beyond the village's eastern edge before its expansion and the construction of the double palisade.

B19 and B25 each included an adult and an older child. The children were in the 7–10 year age span, beyond the ages generally considered for rebirth. None of these people had been exhumed for the ossuary reburial, so they may have been in one of the categories excluded from the ossuary, such as accidental deaths from drowning or

freezing, or they may have been outsiders, such as refugees, visitors, or captives who had no community affiliation strong enough to allow their burial in a longhouse. The two children, B19B and B25B, are in an age range with very low mortality (Merrett 2003), so their deaths may well have been accidental.

Young Subadult Burial Patterns

Most of the longhouse burials are infants of 1 year or less (n=13), with a small number of young children in the 1–4.5 year range (n=4). Among the infants, most are fetal or neonates (n=8) and fewer are postneonates (n=5). With the exception of B6 (YC) in the H7 Burial Area and B23 (NI) in H11, all had been placed in the residential areas of the longhouses. This age distribution is similar to that of the Draper site (Forrest 2010b: Table 2) and follows the expected mortality curve for subadults, with peaks in early infancy and later, during weaning (e.g., Merrett 2003). The parallel between the house burial age distribution and the subadult mortality curve may reflect either a general Wendat idea of the appropriate age for reincarnation, or simply a direct result of the community's mortality profile.

The longhouse contexts of concern here are the actual residential sectors of the longhouse, namely, the family cubicles and the dyad compartments (Creese 2011, 2012). The family cubicles were aligned along each side of the longhouse and consisted of a section of the side platform and the adjacent lateral corridor zone. The former was purely private space, while the latter allowed some public access. People passing through the longhouse would have had to move in part through the lateral corridor zones to avoid walking through the sweat lodges and hearths spaced along the central zone. The central zone and its features were apparently shared by the two nuclear families that faced each other across the corridor. The two family cubicles and their shared part of the central corridor zone formed a dyad compartment. The sharing and intimacy of this arrangement suggests that the two families would have been closely related. Other people passing through this space were probably also kin, fellow members of the longhouse social unit. Visitors from outside would have been less frequent passersby.

There were two subadult burials under side platforms, four in the lateral corridor zones, and two whose location may have been either (Table 11). However, those under the side platforms were very near or at the front edge of the platform, adjacent to the lateral corridor zone and perhaps sometimes even intruding into it. Those in the lateral corridor zone tended to be closer to the side platform than to the central zone features. These two proveniences, side platform and lateral corridor zone, should be joined into one, basically nuclear, family space. Infants and young children were buried there in the hope that they would be reincarnated in the womb of the adult woman living in that space.

There were also six infants buried in the central corridor zone. B15 (PI), if in H3, would also be in this category (if in H2, B15 would have been located in the side platform or lateral corridor zone). The central corridor zone is socially more ambiguous. Women on either side would have been potential mothers to the reincarnated infant. This placement may be further evidence of the closeness of the relationship between the two families sharing a dyad compartment. Burial placement in the central zone may have been viewed as doubling the likelihood of the infant's rebirth to an appropriate mother.

The assumption here is that a subadult burial was placed in a space where reincarnation would be assured in a particular woman. The decision about burial placement probably rested with the families occupying the dyad compartment, and in particular with the woman who had lost the infant. Her decision on whether or not to attempt the reincarnation, by burying the infant in the family cubicle, would have involved a variety of considerations. Foremost among these probably would be personal and familial concerns: her own health and age; the health of the lost infant; the possibility of endangering her other children; the presence of sufficient resources; and, perhaps most of all, the level of her grief. Broader social concerns, such as the matriclan need for recruitment, might also be considered. If the

mother had also died, the decision to reincarnate may have passed to the woman living in the other half of the dyad compartment.

Apparently the decision was frequently to not attempt reincarnation. There were only 15 burials of 16 infants and young children in Keffer residential space. A number of other individuals in those age categories would also have died over the 20–30 years that Keffer was occupied. Some Keffer longhouses, although large and intensively occupied, had no subadult burials at all. Unfortunately, these decisions about rebirth cannot be precisely quantified with the available evidence. Village burials and ossuary series are both biased selections and cannot be used separately to calculate overall subadult mortality; both would have to have been from the same community.

There were also a few other subadults, besides the H11 examples, sharing dyad compartments in the Keffer longhouses. B1 (PI) and B2 (YC) were in the same dyad compartment in H1, B1 in the central zone and B2 under a side platform (Figure 4). The two subadults share most dental traits but differ in the hypocone and delta variant features (Tables 6–9). B10 (NI) and B11 (YC) shared a H7 dyad compartment, B10 in the central zone and B11 under a side platform (Figure 5). These two differ in several traits (Tables 6–9). A sibling relationship is a possibility for B1 and B2 but unlikely for B10 and B11, although a more distant relationship remains possible for B10 and B11 (Paul and Stojanowski 2015).

The Longhouse Social Unit

Matrilineal clans played a major role in Wendat life, but it is difficult to assess just how they intersected with the longhouse social unit (Birch 2008). Both the historical and the archaeological record are ambiguous in this respect, with some suggesting a core of matrilineally related women for the longhouse and others pointing to mixed relationships. The most relevant evidence for Keffer is provided by Larocque (1986), who analyzed the Keffer ossuary collection held at the Royal Ontario Museum and found considerable male heterogeneity, indicating a uxorilocal postmarital residence pattern for the Keffer community.

In fact, the longhouse would probably have been occupied by a mix of people. Although the longhouse was apparently a coherent social unit, some degree of agency and pragmatism may be expected in the admission of residents. There was likely a core of women from the same matriclan, which would fit with Larocque's (1986:78) findings. The presence of several infant burials in the shared central corridor zone indicates that at least those paired families included matriclan sisters. The homogeneity of burial position in H11 also suggests a cohesive social unit. However, some men from the same clan (perhaps sons or brothers of the women residents) may have invoked their kin ties to bring their families into the house. They may even have been able, if necessary, to use these same ties to marshal the resources and labour necessary to construct an extension.

The presence of these men would also mean the presence of their wives and children, all of a different clan. This situation would present the risk of an incestuous rebirth, or at least a rebirth in a woman of a different clan, if reincarnation was easily accomplished in any passing woman. For that reason it seems likely that reincarnation was viewed as a process, not an event. Some close and prolonged exposure of the proposed mother to the infant's body would have been required. The months that would have to pass before seeing the evidence that a reincarnation had been successful would logically suggest to the Wendat that the process took some time. This interpretation would also mean that the occasional woman of another clan passing down the longhouse corridor, or the young woman (B4) in the end cubicle of Keffer H3 (Figure 6), would not have been likely to bear a socially improper reincarnation.

Steckley (1986) has suggested that the primary social reference for a newborn's identity was the father, who "planted the seed." The infant's membership in the mother's clan would not have been formally recognized until the naming ceremony, which would have taken place at some later time. If the infant were to die, it would have been buried in a place that would ensure it could not be reborn in a woman of the father's clan,

which would have seemed a form of incest to the Wendat. The safest location for the burial, then, would have been some place that only the mother's clan sisters would frequent, namely, the mother's family cubicle or paths leading to the matriclan fields (Steckley 1986:7).

Most of these interpretations seem quite reasonable. However, although the naming ceremony may not have taken place, there also was a birth ceremony that would have involved the recognition of the infant as a member of the family, if not the clan. It was described by Sagard and identified archaeologically by Ramsden and Saunders (1986). The latter authors also suggested that the infant was buried where it had been born. The infant's paternity would have been known and appreciated, although one can imagine the occasional case of a lurking doubt, given the different sexual mores that so distressed the Jesuits (Tooker 1964:127). What would have been incontestable was the identity of the mother, and thus also the clan affiliation, actual or potential, of the infant. This concern, then, was the more important one in the selection of the burial location; not the avoidance of spiritual incest, but the restoration of the soul to the clan and to the grieving mother. Furthermore, this decision would probably have been made by the original mother, not the father or her clan sisters. If she were unable to bear the reincarnated infant, she would likely have chosen the woman to take her place. The central corridor zone burials suggest that the person chosen may often have been a close kinswoman.

Related Sites

Keffer was the latest and largest in the sequence of village sites along the Don River drainage. Initially small, it grew in part through internal population growth (longhouse extensions) and in part through the incorporation of other groups or communities in the area (Smith 2014; Williamson 2014:21-23). The consistency of infant burial treatment and location indicates that most of these other communities shared the same understandings about infant reincarnation and that they were probably culturally very similar to Keffer. Two other sites, both on the upper Don River, offer information relevant to our understanding of Keffer.

The Watford site (AlGu-5) included six longhouses (two of them overlapping) inside a palisade and a seventh just outside (London Museum of Archaeology 1997). The primary burial of a neonatal infant had been placed in the midline of the exterior house (Spence 2012). Eighteen fragments of human bone were also recovered from seven non-burial features around the site (Spence 2012). Most of these probably represent sorted deposits, where exhumed burials were prepared for secondary burial. However, a small piece of adult parietal bone from a midden and most of an adult frontal bone from a pit outside the east end of the exterior house may have been from executed captives.

The people of Watford probably made up part of the growing Keffer village, moving there either directly or through an intervening site. The infant burial in the Watford longhouse indicates that infant reincarnation was already being practiced in the area.

The Hidden Spring site (AlGu-368) may have been a special-function outpost of the Keffer village (Archaeological Services Inc. 2010; Williamson 2014:23). It consisted of two overlapping longhouses. There were four burials, containing a total of six individuals (Hutcheson and Forrest 2010). Burial 1 was the primary interment of an adult outside the longhouses. Burial 2 consisted of a primary adult and child burial under the side platform of the later of the two houses. Burial 3, in the central corridor zone of the same house, held the primary burial of an older child and the secondary burial of an adult. Burial 4, to the side of the corridor in the earlier house, was the primary burial of a neonate.

The idea that Hidden Spring was related to Keffer gains support from one surprising observation: the child in Burial 2, about 2–3 years old, had the right mandibular central and lateral deciduous incisors fused together (Hutcheson and Forrest 2010:75). At Keffer, B28 in H20, a child of about 3 years, had fused left mandibular central and lateral deciduous incisors. This trait is a rare and genetically based one. Its frequency is 0.02 percent among Caucasian individuals and 0.32

percent among Japanese individuals, although in one Japanese series it reached 1.75 percent (Rao et al. 2014; Yonazu et al. 1999). In Fort Ancient sites (c. A.D. 1100–1700) in southern Ohio, the incidence of double deciduous mandibular teeth reaches 9.41 percent, although in other parts of the American Midwest and the Great Lakes it is only 1.35 percent (Sciulli 1998; Sciulli and Cook 2016). Its presence at Keffer and Hidden Spring suggests a close relationship between their occupants, and perhaps some connection with populations south of the Great Lakes.

Conclusions

Admittedly, there are a number of assumptions and not a little speculation in the preceding text, although none of it seems unreasonable. Some speculation becomes possible, perhaps even required, with a database such as that from Keffer. Not only are there numerically more burials than in other excavated Wendat villages, but there are also more in proportion to the number of longhouses than at most sites. Also, the location of the burials with respect to the architectural elements of the longhouse interiors has allowed some inferences about longhouse social structure and relationships. Some patterns have become visible, but there is some question about whether those patterns can be uncritically applied to other Wendat sites. Although the widespread presence of infants in houses and their corresponding underrepresentation in some ossuaries corroborates the French observers' accounts of a belief in infant reincarnation, the broad variation among Wendat sites indicates that the beliefs and practices associated with reincarnation (e.g., which infants were appropriate candidates for reincarnation, and where they should be placed) apparently differed from community to community.

At Keffer, reincarnation seems to have been a broadly acceptable option taken by a number of grieving mothers. Others, however, either did not or could not attempt it. There could be a variety of reasons for this: they did not survive the original birth, they were not part of the house social unit, their health made it too risky, there was no supporting father or some doubt about paternity, their grief discouraged another attempt, and more. Without the complementary evidence from the ossuary (or ossuaries), we cannot calculate the frequency of such decisions.

B13, the adult man in H8, was placed in a family cubicle, similar to the young children and infants selected for reincarnation. Although the historical record is not clear on the matter of adult reincarnation, von Gernet (1994) says that the Wendat believed that elements of the deceased person's character and perhaps physical being could be reincarnated in or transferred to a living person. Perhaps the woman living in that family cubicle (and another woman at Draper) pushed this ill-defined belief a bit further, blending it with the belief in infant rebirth to underwrite an attempt to reincarnate a beloved adult, perhaps a victim of war. If that individual had died bravely in defence of the community, it may have made the other longhouse residents and community members more tolerant of this deviation from established practice.

Other adults, a young child, and an infant were buried in Keffer longhouses, but in non-residential areas, where they would not have had the prolonged exposure necessary for successful reincarnation. They were in end cubicles, in the H7 Burial Area, and in the H11 side entry area. In the case of the subadults (B6, B23) it may be that the clan affiliation recognized in the original birth was inappropriate for rebirth within that particular longhouse. Still other anomalous burials were in the primary cemetery; for some reason they had not been exhumed for the ossuary. The presence among them of two older children (7–11 years) may mean that these children had suffered accidental deaths, such as drowning, that precluded their exhumation for the ossuary. On the other hand, some may have been outsiders who died while visiting the community and lacked the social connections necessary for a longhouse burial or for inclusion in the ossuary.

Finally, the social character of the longhouse is now somewhat clearer. The dyad compartments were probably occupied by closely related families, to judge by the intimacy of the arrangement and the sharing of facilities in the central corridor

zone. Furthermore, the presence of infant burials in the central corridor zone of some dyad compartments suggests that in those cases the adult women in the two family cubicles were matriclan sisters. This patterning still does not tell us how completely the matriclan dominated the social life of the longhouse. However, at least in the case of H11, the common position and orientation of three of the four burials shows that one matriclan had a prominent role in the house.

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Keffer (AkGv-14), un site wendat de la fin du 15e siècle sur la rivière Don, s'est développé pendant un période de deux à trois décennies pour finalement inclure 15 maisons longues et une population estimée à 744 personnes. Au cours des fouilles complètes, 29 individus ont été retrouves dans 27 vestiges de sépultures. Dix-sept de ces enterrements de maison longue étaient de nourrissons ou de jeunes enfants. Une analyse détaillée de leur emplacement par rapport aux caractéristiques intérieures des maisons longues suggère que la réincarnation était le résultat attendu de leur enterrement, que la réincarnation était considérée comme un processus plutôt qu'un événement, et que des précautions étaient prises pour s'assurer qu'ils renaîtraient d'une mère matrilinéaire appropriée. Les 12 autres individus décrits ici en incluent 4 des maisons longues, 5 venant d'ailleurs dans le village, et 3 d'un cimetière d'enterrement primaire juste à l'extérieur du village. Nous discutons également du contexte culturel et archéologique des nombreux ossements humains provenant des contextes de l'enfouissement et d'autres contextes non-funéraires au sein du village et de l'ossuaire dans lequel la majorité des villageois décédés ont été enterrés. Bien que cet article inclut un large éventail de contextes mortuaires, une reconstitution complète du programme mortuaire du site Keffer est difficile puisqu'il manque des données ostéologiques et dentaires comparatives de l'ossuaire et des autres cimetières primaires présumés exister au-delà des limites du village.

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Minimum Sample Sizes, Recovery Techniques, and the Reporting of Animal Bones from Historic-Period Assemblages in Ontario

Eric Tourigny

An overview of faunal assemblages from Euro-Canadian historic period sites located across southern and eastern Ontario challenges the validity of faunal analyses that strictly adhere to the Ontario Standards and Guidelines for Consultant Archaeologists. Through its requirement to only identify 500 animal remain specimens, the standards and guidelines inadvertently suggest that such a sample size is large enough to be representative of the archaeological deposit. Results indicate that sample sizes under 2,000 are insufficient to properly address one of the most fundamental zooarchaeological research questions: Which animal species were exploited by past site occupants? Fish are particularly underrepresented in historic faunal assemblages, and links are made to excavation strategies and their effects on the data being generated. New standards for minimum sample sizes and excavation strategies are recommended based on analyses examining the extent to which assemblages have been sampled to redundancy. Also discussed are the inconsistent ways in which faunal analyses are currently being presented and a need to update the current standards and guidelines with regards to zooarchaeology.

Introduction

Recognizing the potential of faunal remains in contributing to our understanding of the past, the province of Ontario now requires archaeological licence holders to conduct an analysis of animal bones recovered from archaeological sites (Ontario Ministry of Tourism and Culture 2011). The majority of archaeological excavations conducted in Ontario are performed under the umbrella of cultural resource management (CRM), and as a result, the majority of faunal reports describing archaeological assemblages pertaining to the historical period are written for the commercial sector. These are generally produced either in-house or by external consultants commissioned by the licence holder in order to satisfy minimum standards set out by the provincial government in the *Standards and Guidelines for Consultant Archaeologists* (Ontario Ministry of Tourism and Culture 2011), as opposed to being produced by zooarchaeologists addressing specific research questions or pursuing academic interests. Some zooarchaeologists working in the commercial sector go above and beyond minimum requirements in an effort to produce informative reports that make the most out of the data. However, tight budgets and pressing deadlines likely affect the amount of time they can spend on each assemblage. Some commercial units prefer to have faunal remains analyzed in house, by members of staff whose methods and level of skill and experience may vary. The lack of any kind of system of recognition or accreditation to identify properly trained zooarchaeologists is an issue here. There is no requirement in the Standards and Guidelines for individuals to have received formal training in zooarchaeology (e.g., an undergraduate course with an identification component). Those

who have received formal training may not have the necessary experience to recognize the subtleties in bone morphology between certain species or may not recognize the importance of using a complete reference collection to make identifications, all of which can lead to the production of erroneous data.

The most fundamental research question addressed by zooarchaeological analyses concerns the identification of the range of animal species represented in the archaeological assemblage. This information can be used to investigate past diet and subsistence strategies, changing environments, human–animal relationships, and many other important research areas. Using archaeological data from multiple Euro-Canadian historic period sites located across the southern and eastern portions of Ontario, this paper assesses the extent to which zooarchaeological analyses are capable of confidently addressing this research question if they adhere to the province's minimum standards. By examining the extent to which previously excavated sites were sampled to redundancy, this study estimates the minimum sample sizes required to identify the majority of the taxa that tend to be recovered from historical sites. It does so using datasets produced both for the commercial sector and for academic research, both before and after the implementation of the *Standards and Guidelines* in 2011. This is followed with a discussion on how changes to these *Standards and Guidelines* could lead to faunal analysts producing data that are more representative of the surviving archaeological assemblage.

Ontario's Standards and Guidelines

The Standards and Guidelines for best practice in Ontario archaeology were first published by the provincial government in 2011, and the aspects that affect zooarchaeology have not been updated since that time. The document lists a series of criteria that must be met as a condition of holding a licence to conduct archaeological fieldwork in the province (Ontario Ministry of Tourism and Culture 2011). According to this document, its purpose is to provide a series of basic technical, procedural, and reporting requirements, all of which were developed in consultation with the community of practicing archaeologists, as necessary steps to follow when conducting archaeological work in Ontario. The text goes on to suggest additional guidelines describing methods of good practice that go beyond the requirements provided by the standards. The standards note that specialist studies, including the study of animal bones, need only be performed when analyzing materials originating from Stage 4 excavations (that is, full mitigation, rather than just test excavation). The document further describes the minimum standards required for a zooarchaeological report (Ontario Ministry of Tourism and Culture 2011:106-108). The column titled "Standards (required)" consists of two bullet points: 1. "provide counts, by excavated context, identified to the lowest identifiable taxon", and 2. "provide separate counts of all heat-altered specimens.." The column titled "Guidelines (optional)" indicates that "sampling may be used to reduce the scale of analysis of faunal assemblages of over 500 specimens" and that any additional material simply needs to be listed according to taxonomic class (e.g., mammals, fish, birds, etc.).

These directions are ambiguous and therefore leave room for interpretation. It is unclear if they suggest that, in the case of large assemblages, analysts need to identify 500 specimens below the taxonomic level of class, to the lowest taxonomic level feasible or, alternatively, that analysts simply need to describe 500 specimens from such a sample in total, regardless of how many of these are identifiable below the taxonomic level of class. The following guideline further confuses the message: "Sampling may not be used to reduce the minimum to less than 500 specimens described overall." In that sentence, it is unclear what the government means by "described." For the sake of clarity, in this study I interpret the standards to mean that only 500 specimens need to be identified to the lowest taxonomic level possible, whatever that may be for each item. How zooarchaeologists choose the items to identify within a bone assemblage they are provided with is left up to them, so long as they justify their

sampling strategy. The guidelines suggest but do not require that zooarchaeologists identify the skeletal element represented by each identified specimen. Since, with a few exceptions, the identification process inherently requires the skeletal element to be identified before the specimen can be identified to taxon, zooarchaeologists operating in the province are automatically going beyond the required guidelines when conducting analyses. However, not all provide the information on skeletal element in their reports.

No references or explanations are provided for the seemingly arbitrary number of 500 specimens, which was arrived at after consultations with members of Ontario's archaeological community. One study did recommend similar sample sizes after investigating faunal assemblages from sites across the North Atlantic region (Greenland, Iceland, and Labrador) (Amorosi et al. 1996), and it is possible that this study is the source for the cut-off of 500. It found that samples of 500 specimens were sufficient when addressing research questions simply concerned with the identification of species present. However, the quality and representativeness of a faunal assemblage – species identifications, age at death, body portion representation – depends on a number of natural and cultural factors, such as initial deposition behaviours, pre- and post-depositional taphonomic factors, and archaeological recovery practices. The authors of that study warn that their conclusions should not be extended to different site types in other parts of the world.

A second possible explanation relates to the fact that many zooarchaeologists working in the province (myself included) were trained in zooarchaeological methods either directly by Howard Savage or by one of his many students. Savage taught zooarchaeology at the University of Toronto between 1973 and 1995 and, as a core part of his course, he required undergraduate students to identify at least 500 specimens to the level of taxonomic family or lower from a never-before analyzed assemblage (Stewart and Friesen 1997:3). I imagine Savage came up with this arbitrary number in part in order to limit the workload students had to undertake within the context of an undergraduate course; however, the number appears to be a part of his legacy in Ontario zooarchaeology. Many of his former students continued to study archaeology and are now teaching zooarchaeological methods to a second generation of undergraduates all over the world. Some of them also require their students to analyze 500 specimens to the level of taxonomic family or lower. It is possible that this arbitrary number was unquestioningly adopted by many of those students now working in the province and was subsequently recommended to the government of Ontario when it began drafting standards and guidelines for best practice. However, the vague wording employed by the government resulted in only 500 specimens needing to be examined in total which in most cases would result in significantly fewer than 500 identifications below the taxonomic level of class.

Materials

This paper makes use of reports on 42 different assemblages recovered from 34 archaeological sites located throughout the southern and eastern regions of Ontario (Table 1; Fig. 1), generated by zooarchaeologists working in either academic settings or for the commercial sector over the past 35 years. All sites are located in similar ecological zones: the Lake Simcoe-Rideau and the Lake Erie-Lake Ontario ecoregions. These represent mixed woodland plains of similar underlying ecologies and climates (Crins et al. 2009). Similar environments offer us a chance to examine assemblages that are likely to share comparable organic preservation conditions despite being located far apart from one another. With one exception, these faunal remains were likely recovered by dry screening soils through a 6.4 mm mesh, which is required by the Ontario *Standards and Guidelines*. This screen size is assumed in the case of many older reports, which often omit information on recovery methods. One assemblage was a flotation sample sieved through finer mesh screen; this is noted in Table 1.

Most sites represent domestic deposits from urban or rural areas and date from the late 18th

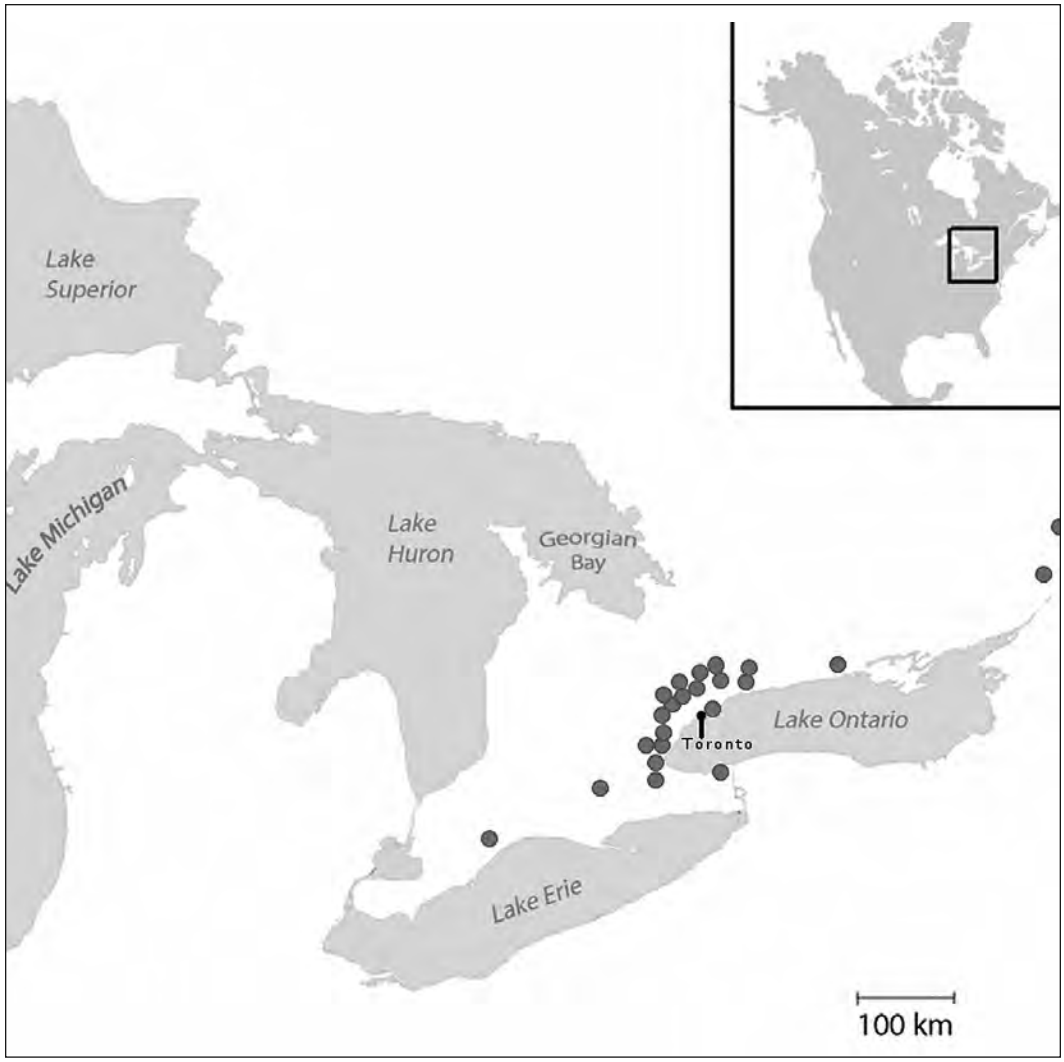

Figure 1. *Locations of sites outside of downtown Toronto included in this study.*

through to the early 20th centuries. Upon initial investigation of the reports, it was immediately evident that the lack of any standards and guidelines prior to 2011 and the largely non-prescriptive nature of the standards and guidelines implemented in 2011 have led to inconsistency in the presentation of text and data. Some reports only list counts according to identified taxa, while others provide further details, such as body portion representation or age at death analyses. The majority of recent reports are more comprehensive in terms of the amount of information being presented, whereas older reports tend to be less informative and more ambiguous about the origins of their data and the methods used to arrive at their conclusions. Currently, reporting practices vary significantly between reports produced by different authors and often between those produced by the same author for different sites, making it difficult to compare multiple assemblages in anything other than a qualitative manner (Tourigny 2016). However, the requirement to list the number of specimens identified to the lowest possible taxonomic

Table 1. *List and description of faunal assemblages used in this study (recovered using 6.4 mm dry screening except for the assemblage marked *, which was recovered through flotation). Note: all post-2011 reports were*

Site (Borden #)	Location	Occupation period
327-333 Queen St W. - 3 deposits (AjGu-63)	Toronto	ca. 1830s-1850s
55 H3 (AlGv-383)	Vaughan	ca. 1831-1860s
Ashbridge Estate - 2 occupation phases (AjGt-1)	Toronto	ca. 1796-1913; 1904-1970
Bell (AjGu-68)	Toronto	ca. 1840-1870s
Bethune-Thompson House (BgFp-39)	Williamstown	ca. 1783-1905
Bishop's Block (4 house deposits) (AjGu-49)	Toronto	Late 19th to early 20th century
Botanical View Estates (AhGx-273)	Dundas	19th century
Butler (AhGs-18)	Niagara-on-the-Lake	ca. 1784-1813
Cartwright Compound (BbGc-92)	Kingston	ca. 1790s-1820
Crinan Creek (AdHj-15)	Crinan	ca. 1850-1860
Deacon (Akgw-428)	Caledon	ca. 1828-mid 1850s
Delong 1 (AlGr-139)	Whitby	ca. 1830-1870
Dollery, (2 house deposits) (AjGu-81)	Toronto	ca. 1855-1878
Dunsmore (AkGw-397)	Caledon	1840s to early 20th century
Edgar (AlGu-196)	Vaughan	ca. 1830s-1870
Fletcher (AkGv-74)	Vaughan	ca. 1840-1860
Fralick's Tavern (Borden unknown)	Niagara Falls	ca. 1840s-1850s
Front Street (AjGu-15) (flotation sample)	Toronto	19th century
Graham (AlGs-370)	Pickering	1830s to late 19th century
Hall (AlGw-68)	King township	1850s-1910s
Inge-va (BfGb-2)	Perth	ca. 1823-late 19th century
John Beaton II (AlGv-219)	Vaughan	1840s-1870s
King-Caroline (AjGu-82)	Toronto	ca. 1820-1870
Lewis (Phase 1) (AlGu-365)	Whitchurch-Stouffville	ca. 1825-1850
Lewis (Phase 2) (AlGu-365)	Whitchurch-Stouffville	ca. 1870-1880
Lowry-Hannon, Lot 31 (AjGu-79)	Toronto	Mid- to late 19th century
Marsden (AiHd-105)	Waterloo	Mid-19th century
Rasputine (AjGw-34)	9th line & Burnhamthorpe Rd.	ca. 1900s
Smith's Knoll (AhGw-132)	Stoney Creek	ca. 1875-1910
Speers (AiGw-547)	Milton	ca. 1830s-1860s
Ste. Famille Separate School (BiFw-88)	Ottawa	ca. 1861-1881
Toronto General Hospital (AjGu-51)	Toronto	ca. 1819-1862
Wilson Tenant (AlGr-194)	Whitby	ca. 1830s-1850s
Yeager (AhGw-256)	Hamilton	ca. 1830s to 1850s
Yeigh (AgHc-1)	Burford	ca. 1803-1829

produced after the implementation of the Ontario Standards and Guidelines.

Site type	Study type	Number of specimens	% id'd family or lower	Source
Urban, domestic (3 privies)	PhD thesis	327; 493;189	73.1; 26.3; 46.1	Tourigny 2016
Rural, domestic	CRM report	770	46.1	Berg 2015
Rural, domestic	PhD thesis	785; 7,801	29.7; 19.5	Tourigny 2016
Urban, domestic	PhD thesis	375	27.2	Tourigny 2016
Rural, domestic	Comm. Report	2,443	30.4	Casey 1994
Urban, domestic	CRM report; PhD thesis	5,821; 2,982; 1,242; 892	23.9; 34.0; 23.6; 50.3	Needs-Howarth 2011a; Tourigny 2016
Farm, rural, domestic	CRM report	2,326	81.9	Prevec 1992
Rural, domestic	CRM report	14,616	8.2	Needs-Howarth 2009a
Urban, domestic; officers' HQ	CRM report	6,606	27.0	Needs-Howarth 2009b
Rural, cabin site	CRM report	704	48.2	Prevec 1982
Rural, domestic	CRM report	704	24.9	Needs-Howarth 2014a
Rural, domestic	CRM report	887	52.5	Berg 2014a
Urban, domestic	CRM report; PhD thesis	708; 578	45.3; 40.0	Needs-Howarth 2012; Tourigny 2016
Rural, domestic	CRM report	491	29.3	Berg 2014b
Rural, domestic	CRM report	1,433	17.4	Needs-Howarth 2006
Blacksmith shop/house	CRM report	668	29.8	Prevec 1989
Urban, domestic; tavern	CRM report	768	66.9	Prevec 2001
Urban, drain feature	CRM report	613	23.2	Prevec 1985
Rural, domestic	PhD thesis	1,588	12.6	Tourigny 2016
Rural, domestic	PhD thesis	1,597	22.7	Tourigny 2016
Urban, domestic	CRM report	4,310	47.6	Dieterman 1988
Rural, domestic	PhD thesis	404	38.0	Tourigny 2016
Urban, house lots/storefront	CRM report	2,614	50.1	Needs-Howarth 2013
Rural, domestic and kiln sites	PhD thesis	1,748	21.7	Tourigny 2016
Rural, domestic	PhD thesis	1,434	22.4	Tourigny 2016
Urban, domestic	CRM report	1,340	29.3	Needs-Howarth 2014b
Urban, domestic	CRM report	575	21.6	Prevec 1995
Rural, ?domestic	CRM report	921	73.9	Prevec 1983
Urban, domestic	CRM report	1,037	37.0	Prevec 1998, 1999
Rural, domestic	CRM report	1,198	29.1	Needs-Howarth 2014c
Urban, domestic	CRM report	6,368	29.6	Needs-Howarth 2009
Urban, hospital	CRM report	4,989	34.5	Needs-Howarth 2011b
Rural, domestic	CRM report	1,540	54.4	Berg 2014c
Rural, domestic	CRM report	574	75.3	Needs-Howarth 2011c
Rural, kiln site	CRM report	356	11.8	Prevec 1981

designation (NISP) makes the presentation of this type of data consistent between reports, and it is therefore possible to compare species representation between sites.

Taxonomic Richness

A variety of destructive, post-depositional taphonomic processes are known to affect archaeological faunal materials (Lyman 1994). These processes, combined with the fact that few sites are ever completely excavated, provide an incentive for zooarchaeologists to adopt appropriate sampling strategies in order to obtain a dataset that is truly representative of what survived of the original deposit. This factor is the most crucial one in assessing the quality of faunal datasets (Lyman 2008:141). Because minimum sample sizes and sampling strategies are one of the few things discussed by Ontario's standards and guidelines with respect to zooarchaeology, the extent to which data resulting from the adoption of these guidelines are truly representative for historic period Euro-Canadian sites is discussed in this section. Sample sizes are compared with NISP values for the various Euro-Canadian assemblages in order to identify the minimum sample sizes necessary to recover the majority of taxa normally encountered at these types of sites.

The following comparison investigates when sites have been sampled to redundancy: the point at which the average faunal assemblage is so large that increasing its sample size is unlikely to result in the identification of new species (Leonard 1987; Lyman 2008: 143-152). The target variable being measured is the number of identified taxa (NTAXA) of all animal species identified at a site. Identifying this variable is simple; it involves a tally of the unique number of taxonomic entities identified within an assemblage. Here, the total number of genera is used as the basis for this calculation because, in many instances, specimens cannot be confidently identified to the species level – for example, brown rat (*Rattus norvegicus*) and black rat (*Rattus rattus*) specimens are often only identified as *Rattus* sp. – but, at the same time, the presence of a new genus can still inform on species diversity at the site. Certain species are difficult to distinguish between genera (e.g., sheep and goat), and standard practice is to identify these to a higher taxonomic level (to the subfamily level of Caprinae in the case of the previous example). If identifications were made to a higher level and no further specimens were identified to a taxonomic level subsumed by the higher-level designation – for example, Caprinae specimens are identified, but no sheep (*Ovis aries*) or goat (*Capra hircus*) are identified, then the minimum number of species within an assemblage increases by one.

NTAXA values were calculated for each site presented in Table 1. These were plotted relative to sample size, and a best fit logarithmic trendline was drawn. The resulting curve trends towards a horizontal asymptote. The point at which the curve approaches the asymptote (i.e., where $\sum y$ nears 0, or where the curve loses its steepness and becomes more horizontal) indicates the point at which the average assemblage has reached a large enough size and where the addition of further specimens would not result in many more new genera being identified. Surpassing the point of redundancy does not preclude the possibility of identifying new taxa as sample sizes continue to grow. It simply indicates that most genera have been identified and that further increases in sample size are unlikely to add many more. Ideally, faunal identifications would be taking place as materials are being excavated and the point of redundancy could be identified on-site, allowing for sampling strategies to be modified accordingly; however, this approach would be impractical for identification purposes and costly for those funding the excavations. In Ontario, faunal remains are generally recovered because they are part of a site that is about to be disturbed by planned developments. As such, encountered bones are collected and only later identified by the specialist. Since on-site faunal identifications are impractical and each site can be subject to different levels of fragmentation and preservation, the following analyses compare NTAXA values to the overall size of faunal assemblages in order to give an idea of how much of the excavated sample needs to be analyzed in order to be representative.

This method of identifying redundant samples also presumes that the distribution of faunal remains is homogenous across each site.

This homogeneity is unlikely to be the case within most archaeological assemblages, because different preservation conditions, site functions and original deposition patterns likely resulted in different species being represented unevenly across a site. Whenever the information was made available in reports or whenever access to original databases was possible, assemblages within an archaeological site were broken down according to feature or other known divisions within a site (e.g., Bishop's Block, 327-333 Queen Street West). Unfortunately, in most cases, reports presented the zooarchaeological data for the site as a whole and did not allow for the exploration of heterogeneity of faunal distributions across the sites. This heterogeneity is something that will need to be kept in mind as we later consider how best to go about excavating and sampling zooarchaeological remains from historic Euro-Canadian sites.

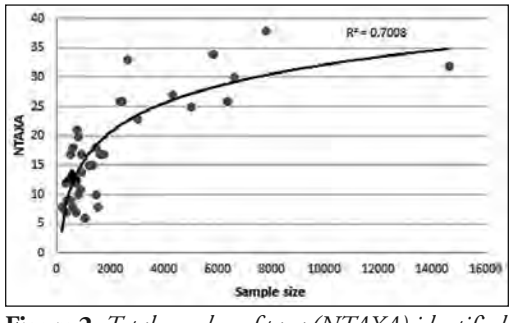

Figure 2. *Total number of taxa (NTAXA) identified at archaeological sites relative to sample size. A triangle is used to denote the sample obtained through flotation.*

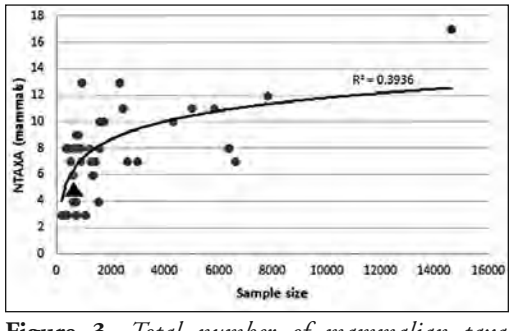

Figure 3. *Total number of mammalian taxa (NTAXA) identified at archaeological sites relative to sample size. A triangle is used to denote the sample obtained through flotation.*

Figure 2 plots NTAXA values relative to sample size from historic sites across Ontario. The results conform to the expected pattern (Lyman 2008:146-149), producing an asymptotic best-fit curve suggesting that assemblages with fewer than 1,800 to 2,000 specimens do not present the full range of typically available genera from these types of sites. After surpassing the 2,000 specimens benchmark, fewer new genera tend to be identified from the individual assemblages. The data suggest that smaller assemblages are not necessarily unrepresentative of the full range of species present on an archaeological site (i.e., some samples with fewer than 1,000 specimens display elevated NTAXA values).

Figure 3 limits the analysis to the number of identified mammalian genera relative to total sample size. It is immediately apparent that, when compared with the previous figure, values are a bit more spread out and the closeness of fit between the asymptotic curve and the data is more moderate (R^2=0.38). The curve suggests that a sample size threshold of approximately 1,200 specimens is needed before fewer new genera are identified; however, quite a few assemblages with fewer than 1,000 specimens do have a large number of identified mammalian genera. This result suggests that mammalian bones are not as susceptible to smaller sample sizes and that assemblages with fewer than 1,200 faunal specimens may still have a representative mammalian assemblage.

Stronger correlations are observed between sample size and the identified number of bird and fish species (Figures 4 and 5). Sample sizes of approximately 1,800 to 2,000 specimens, are required in order to identify most bird or fish taxa present in an assemblage. The data for fish is slightly skewed by the presence of one assemblage where excavators employed a bulk soil sampling strategy and materials were screened through a smaller mesh size (Front Street). The removal of this sample from the figure provides a stronger correlation between sample size and NTAXA (R^2=0.50). This further shows that smaller sample sizes processed through finer screens can lead to

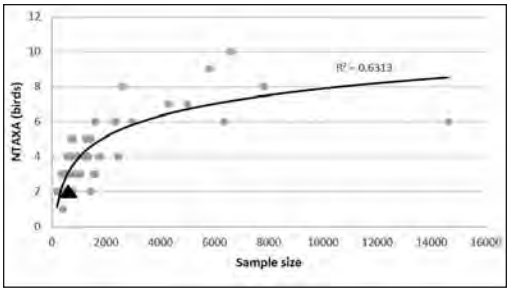

Figure 4. *Total number of bird taxa (NTAXA) identified at archaeological sites relative to sample size. A triangle is used to denote the sample obtained through flotation.*

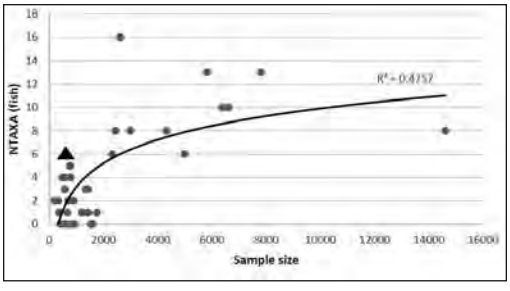

Figure 5. *Total number of fish taxa (NTAXA) identified at archaeological sites relative to sample size. A triangle is used to denote the sample obtained through flotation.*

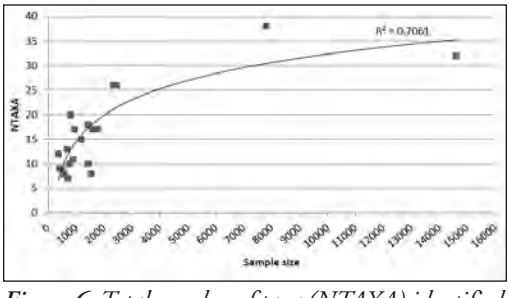

Figure 6. *Total number of taxa (NTAXA) identified from archaeological sites in rural settings.*

significantly larger proportions of fish specimens being recovered and subsequently identified to a lower taxonomic level. The recovery of fish specimens is more likely to be influenced by screening strategies than that of mammal or bird specimens (Casteel 1972, 1976; James 1997).

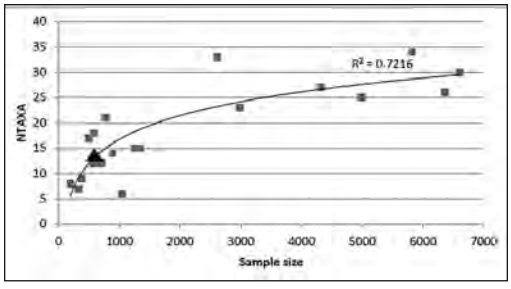

Figure 7. *Total number of taxa (NTAXA) identified from archaeological sites in urban settings. A triangle is used to denote the sample obtained through flotation.*

Some large samples, such as those from the Graham, Lewis, and Edgar sites, produced only one or no fish specimens, while the similarly sized assemblage from the King-Caroline site produced 16 unique taxa, more than any other site included in this study.

Comparison of NTAXA values between urban and rural deposits suggest strong differences between these two types of assemblages (see Figures 6 and 7). These data suggest that most taxa are identified from urban assemblages once these surpass 1,000 specimens in size, whereas rural assemblages require more than 2,000 specimens. The low number of larger rural samples included in this study may have had an effect on the calculation of this estimate, but other factors relating to differential taphonomic processes or to original deposition behaviour may also be at play. Post-depositional processes affecting organic preservation may be different between urban areas and rural sites. The former are often capped by layers of building materials and concrete surfaces, whereas those in rural areas are more likely to be disturbed by agricultural activities and vegetation. Comparisons of the taxa identified from both types of assemblage highlight the lack of fish recovered from rural deposits (Tourigny 2016). Once again, this may relate to differential taphonomic processes, since fragile fish bones are known to be more susceptible to post-depositional destruction and archaeological recovery practices, relative to the bones of larger fauna (e.g., Nagaoka 2005; Szpak 2011). This approach also may be

due to differences in the way faunal materials were originally deposited or to differences in the range of animals consumed between domestic and rural households. A greater variety of household waste disposal techniques were available to those living in a rural setting (i.e. spread across the fields to fertilize crops, fed to livestock, burnt in fires) then were available to most of those living in urban centres, where most faunal remains are recovered from privy or fill deposits. It is noteworthy that studies from elsewhere in the world have noted opposite rural and domestic fish recovery patterns and that they explain these differences as cultural in origin (e.g., Reitz 1986). Given these results, the differential recovery of fish and other small species from archaeological sites is worth further consideration.

Discussion

Effects of Screen Mesh Size

It is well known from the archaeological literature that screening soil deposits results in a greater recovery of smaller faunal remains and that mesh sizes considerably affect the number of animal species recovered and subsequently identified (Barker 1975; Casteel 1972, 1976; Clason and Prummel 1977; Gordon 1993; James 1997; Payne 1972, 1975; Shaffer 1992). Screening on its own does not guarantee that a representative sample will be recovered; emphasis must be placed on screen mesh size and sampling strategies. A large number of studies (for summaries, see James 1997; Lyman 2008:154; Nagaoka 2005; Partlow 2006) have shown how coarse screen sizes (that is, 6.4 mm or greater) tend to miss most of the small-bodied taxa or smaller elements from larger taxa, thus biasing the data towards larger-bodied animals. In his landmark study, Thomas (1969) showed how smaller taxa (i.e., rabbit sized or smaller) will be under-represented if archaeologists rely on 6.4 mm (and even 3.2 mm) mesh sizes alone. However, screening with a 3.2 mm or smaller mesh will drastically affect the amount of time spent sieving in the field, and so archaeologists need to be practical and consider how much time they are willing to spend in the field. In Ontario, a mesh size no greater than 6 mm must be used when conducting Stage 4 excavations on sites post-dating the Archaic period (Ontario Ministry of Tourism and Culture 2011: 32).

Differential approaches to sampling and the use of different screen sizes do not always fully account for differences in species representation at archaeological sites (Gobalet 2005; Zohar and Belmaker 2005). Preservation conditions uniquely affect each assemblage, and the use of smaller mesh sizes will not necessarily result in the greater recovery of smaller elements at every site (Gargett and Vale 2005; Lyman 2008:156). If taphonomic effects prevent the recovery and identification of smaller faunal remains in the first place, then switching to smaller screen sizes would have little effect on increasing the total NTAXA values for each site (Cooper et al. 2006; Lyman 2008:156). Fortunately, the consistent recovery of at least one or two specimens from smaller species, such as mice, rats, small birds and fish, from almost every site studied in this paper indicates not only that these species were present but also that their bones do survive in the archaeological record and can be identified. However, their numbers are likely underestimated. The flotation sample taken from a single feature at the Front Street site in downtown Toronto resulted in an animal bone assemblage with a composition of 77% fish. Although this particular report did not include materials recovered through dry screening with a 6.4 mm mesh, the proportion of fish far surpasses the average identified at other domestic historic sites across Ontario (4.3%) (Tourigny 2016).

Patterns of Taxonomic Richness

The patterns observed regarding taxonomic richness are unsurprising and fit with the expectation that the largest samples should exhibit greater richness and a lower likelihood of new taxa being identified once assemblage sizes surpass a certain threshold (Lyman 2008). Lower thresholds (~1,200 specimens) were identified for the identification of new mammalian taxa relative to fish and bird (~1,800–2,000 specimens). This result is also expected and often relates to one or more of the following three factors: 1) a greater variety of bird and fish taxa are available for

consumption relative to mammalian taxa; 2) mammalian individuals are more likely to contribute to the overall specimen count, thus elevating the NISP without elevating the number of taxa; and, 3) fragmentation of smaller bird and fish elements, as well as their elevated susceptibility to taphonomic and recovery processes reduces their ability to be identified as readily as that of specimens from larger mammalian taxa (Bartosiewicz and Gál, 2007; Hesse 1982; Lyman 2015). The first point applies to Ontario, where a greater variety of wild and domestic bird species is available relative to mammal species, and the last point is generally true of faunal remains in archaeology (Lyman 1994). Overall, the number of bird and fish taxa identified in these assemblages appears to be an expression of sample size.

The second factor also applies to historic assemblages in Ontario. The richness of mammalian species is likely less dependent on sample size, since the meat component of nineteenth-century Euro-Canadian foodways predominantly originated from domestic mammals, particularly cattle, pigs and sheep (Tourigny 2016). Although assemblages with sample sizes below 500 are far too small to address matters of taxonomic variability among all animal species recovered from Ontario historic sites, they may still provide useful data towards the investigation of the primary mammalian components within the foodways of early Euro-Canadians living in the province. Valuable research opportunities lie in further investigating the role of fish and birds in early foodways, as they are known to have regularly contributed to those diets (Tourigny 2016). Small assemblages derived from excavations only employing large screen sizes do not allow archaeologists to fully explore the range of past human–animal interactions or properly understand differential food consumption strategies among ethnic or socio-cultural groups in the province. Adoption of a sampling strategy that makes use of soil samples screened through 3.2 mm or 1.6 mm mesh would strengthen the data from which we draw our interpretations of the past.

There is much to be said for adopting recovery strategies that include the collection of bulk soil samples to be sieved through smaller screens. Archaeological features containing significant faunal deposits, such as middens or privies, should be screened with smaller mesh sizes, allowing for the collection of the greater volumes of faunal materials likely present in these types of deposit. Commercial firms already collect soil samples for archaeobotanical analyses. However, a coordinated effort must be made to ensure that bone fragments are submitted to the zooarchaeologist once the archaeobotanist has sorted through the materials and picked out the plant remains. Collecting such samples may result in the zooarchaeologist identifying more fish and bird species and allow for a better understanding of these traditionally underreported taxa. Our current understanding of the role of fish and wild birds in early Euro-Canadian foodways in Ontario is limited (Tourigny 2016): we understand that the majority of residents incorporated fresh, local fish into their diets, but we are unsure of how regularly fish contributed to their diet. Zooarchaeological data suggests urban residents may have had greater access to imported marine species (e.g., cod, haddock, and mackerel) but that all residents of the province took advantage of locally available freshwater taxa (Tourigny 2016). It remains poorly understood whether freshwater taxa were obtained locally throughout the province or whether people purchased these from markets that were supplied by the commercial fisheries developing in the Great Lakes (Bonnycastle 1833; Brown 1849; Langton 1926; Traill 1857). Better datasets will allow us to further investigate early Ontarian foodways and the organization of local economies.

Sample sizes and the quality of the data are further affected by uncontrollable factors. These factors especially apply in Ontario, where archaeologists working for the commercial sector are limited in choosing which parts of a site they can excavate. Excavation areas may not contain large amounts of faunal remains, either as a result of post-depositional taphonomic factors, such as poor preservation and later disturbances, or simply because few animal bones were deposited there in

the first place. In such instances, all faunal remains should still be identified to the lowest possible taxonomic category, but archaeologists writing the reports should make explicit that sample sizes would need to be bigger in order to confidently derive any significant information from them. Greater details in the levels of taxonomic identification are always preferable, as these provide more robust datasets and allow archaeologists to confidently address more specific research questions, such as how the different species represented at the site were raised, butchered, and consumed.

The majority of faunal reports combine their faunal identifications from across their respective sites into a single summary table. Rarely are all of a site's faunal remains recovered from the same features or representative of a single depositional event, yet they are generally reported on as if they were. The assumed homogeneity of a site's faunal assemblage can hide the appearance of trends and hinder the interpretation of the archaeological site. The three privy contexts analyzed at the 327-333 Queen St. West site highlight how three different deposits from one site, each dating to a similar period of occupation, can contain drastically different faunal deposits. In this case, one privy was almost entirely composed of the cranial and mandibular fragments of very old cattle, while the other two had a mixture of taxa and body parts most often associated with food waste. The deposit of cattle heads likely represents a by-product related to one of the commercial activities conducted at the site (shoemakers are known to have operated from the associated building). Had the faunal remains from all three privies been reported together, it would be difficult to tease out the remains of the different onsite activities. Homogenous distributions should not be immediately assumed when recording and reporting data from historical period sites in Ontario.

The identifiability of faunal materials (the proportion of animal bone remains that can be identified to the level of taxonomic family or lower) varies greatly between assemblages. A range of 8.2% to 81.1% was identified in this study, with an average of 35.5% of recovered faunal remains identified to taxonomic family or lower. These numbers can only be calculated if the faunal report records the total number of recovered animal bones, including those that could not be identified to taxonomic levels beyond class. These numbers are greatly affected by fragmentation levels, which increase the number of faunal specimens without necessarily increasing the number of those identified to taxonomic family or lower. It is interesting to note that the sample with the lowest proportion of identified taxa belonged to that which had the greatest number of specimens, likely as a result of increased fragmentation due to high levels of burning (Butler site, n=14,616). Luckily, the CRM company chose to have every recovered specimen identified, thus providing reliable data on the taxa exploited at the site. Archaeologists and faunal analysts alike should keep this information in mind when considering a minimum sample size to include in an analysis. Best practice should always be for archaeological licence holders to have all faunal remains recovered from an assemblage identified to as precise a taxonomic level as possible. If assemblages become too large and a sampling strategy must be adopted, tracking the increase in number of identified taxa being identified during the identification process represents one way of determining when an assemblage contains an appropriate sample size for assessing taxonomic richness.

Not every research question is concerned with simply identifying the range of species present on any given site. Further questions often focus on issues concerning how the animals lived, died, and interacted with humans, as well as the roles their meat or byproducts played in past foodways. Such research questions demand more information from zooarchaeological data (e.g., age-at-death profiles, body portion representation, butchery patterns, palaeopathology records) and often focus on data gathered from one taxon, therefore requiring larger samples of bones deriving from that particular taxon. For this reason, Ontario's standards and guidelines should not seem to encourage the limitation of overall sample sizes, which in turn leads to less data recovered for individual species.

Fortunately, many zooarchaeologists operating in Ontario provide more information than the standards require. For example, most reports produced in the past 15 years include, along with specimen counts by taxon, further quantification of their data (e.g., assessments of tool marks, analyses of age at death, body portion distribution patterns). However, these are generally presented in the form of qualitative statements: one or two sentences on each topic describing how the analyst interprets the data generated. Few reports discuss how these interpretations were arrived at or detail the quantification methods they used. Without a requirement to provide raw datasets that include standardized recording procedures (at a mimimum: element, side, portion present, state of epiphyseal fusion, evidence of butchery, metrics, palaeopathology), faunal reports are rendered incompatible in any quantitative way, as each one represents a personal interpretation of hidden data, quantified or summarized following one of many different possible methods.

Conclusion

This research demonstrates how current field recovery strategies and minimum sample sizes for faunal identifications are inadequate for the study of archaeological assemblages from the historical period in southern Ontario. The quality of the zooarchaeological data would greatly improve if the Standards and Guidelines as they relate to historic-era assemblages were amended as follows:

1. Excavations should include bulk soil sampling for the recovery of faunal remains, and these bulk samples should be screened on a mesh aperture of 3.2 mm or less;
2. All faunal remains recovered from a site should be examined by a qualified zooarchaeologist
3. These faunal remains should all be identified to the lowest possible taxonomic category unless the sample size of a discrete context exceeds 2,000 specimens total, in which case, the context may be randomly subsampled down to a minimum of 2,000 specimens total.
4. Heterogeneity in the distribution of faunal remains within archaeological sites should be assumed, and bones recovered from different features or areas of a site should be reported on separately in the report;
5. Zooarchaeological data must be recorded in a standardized way and must at minimum include element, side, portion present, state of epiphyseal fusion, evidence of butchery, osteometrics, and palaeopathology; and
6. The raw data must be made available alongside the report.

Adopting these strategies will allow future researchers to make use of the data without having to resort to re-analysis of the materials and will allow us to more confidently reconstruct past subsistence strategies and gain a better understanding of past interactions between humans and the non-human world.

This research made use of data from the historic period, and although its conclusions speak for Euro-Canadian assemblages of the late 18th through to the early 20th centuries in Ontario, I believe some assumptions can be made regarding minimum faunal identification rates for other types of sites in the province. Generally speaking, historic assemblages from Euro-Canadian sites in Ontario tend to include bones that have been broken up through butchery are less likely to be directly exposed to high temperatures. Few are burnt and fragmentation levels are moderate in the samples I have analyzed (Tourigny 2016). However, many earlier, Indigenous sites produce faunal assemblages that are highly fragmented and calcined as a result of being disposed of in a fire. The small bone specimens typical of such assemblages are more difficult to identify to precise taxonomic categories, and the smaller, fragile bones, such as those from small-bodied animals, are more likely to be destroyed before being recovered by archaeologists. The increased difficulty in making identifications, the possible presence of small species, and the likely exploitation of a larger range of wild animals suggests minimum sample sizes for indigenous sites might be larger than for historic Euro-Canadian sites.

The minimum sample sizes suggested here are necessary in order to make confident statements about which animal taxa are present on the site and how each taxon contributed to the original deposit. Such lists have always formed the basis of

faunal reports, and it is one of only two requirements of the current standards and guidelines. Adopting sampling strategies that result in the production of more robust datasets is necessary if we are to confidently address more complex questions regarding past subsistence strategies and human–animal relationships. Improved sampling and reporting, as well as the identification of larger sample sizes, are costly endeavours, and despite the best efforts of many commercial units, there will always be pressure to only meet minimum standards. Unless more instruction is provided by the regulating body, the quality of the archaeological data will continue to be affected.

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Un survol d'assemblages fauniques provenant de sites de la période historique eurocanadienne situés à travers le sud et l'est de l'Ontario conteste la validité des analyses d'assemblages fauniques qui respectent strictement les normes et directives de l'Ontario à l'intention des archéologues-conseils. En permettant un sous-échantillonnage par contexte jusqu'à 500 spécimens de restes d'animaux, les normes et les directives proposent, par mégarde, qu'une telle taille d'échantillonnage soit suffisamment grande pour être représentative du dépôt archéologique. Les résultats indiquent que des tailles d'échantillonnages sous 2000 sont insuffisantes pour répondre correctement à l'une des questions les plus fondamentales de recherche zooarchéologique : quelles espèces animales ont été exploitées par les occupants des sites du passé? Les poissons sont particulièrement sous-représentés dans les assemblages fauniques historiques, et des liens sont établis avec les stratégies de fouilles et leurs effets sur les données générées. De nouvelles normes concernant les tailles minimales d'échantillonnage et les stratégies de fouilles sont recommandées sur la base d'analyses examinant la mesure dans laquelle les assemblages ont été échantillonnés en redondance. Aussi discutés sont les façons actuelles inconsistantes de présenter les analyses fauniques et le besoin de mettre à jour les normes et les directives actuelles en matière de zooarchéologie.

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Mortuary Practices and the Social Adjustment to Village Life at the Younge Phase Bingo Village

Michael W. Spence and Brandy E. George

Bingo Village (AgHk-42) is a Western Basin Younge phase component site in southwestern Ontario, near the modern village of Arkona. It represents a time of village formation, as extended families, which had formerly been the principal settlement unit, came together to create larger and more settled communities. Full excavation of the palisaded Bingo Village site led to the identification of 16 mortuary features with a total of 27 individuals. The features fall into three categories: unexhumed primary burials, sorted deposits, and multiple secondary burials. Sorted deposits are features containing the skeletal elements from exhumed primary burials that had not been selected for inclusion in the subsequent secondary burials. Evidence suggests that primary burial, exhumation, and sorting events were conducted by the social group occupying the deceased person's longhouse, but that these events took place in open areas, thus allowing for the participation of other villagers in the rituals. The secondary burials were more closely tied to the decedent's residential group. This dichotomy of inclusion was probably a result of, and the first step in accommodation to, the pressures created by the novel social environment of the village. The extended family unit, now a longhouse group, still maintained its integrity in the rituals, but the social relevance of the broader community was also recognized in the initial steps of the mortuary sequence.

Introduction

Bingo Village (AgHk-42) was one of a series of archaeological sites in the area around the modern village of Arkona, Lambton County, some 50 km west of London, Ontario (Figure 1). The Arkona cluster dates to the latter part of the Younge phase of the Western Basin tradition. A number of calibrated radiocarbon dates indicates the placement of the sites in the latter half of the twelfth and first half of the thirteenth century A.D. (Neal Ferris, personal communication, 2016; Spence et al. 2010). Their location in the borderland between Younge phase settlements to the west and those of the contemporaneous Glen Meyer phase of the Ontario Iroquois tradition to the east raises the question of the cultural and social influences acting on the Arkona people.

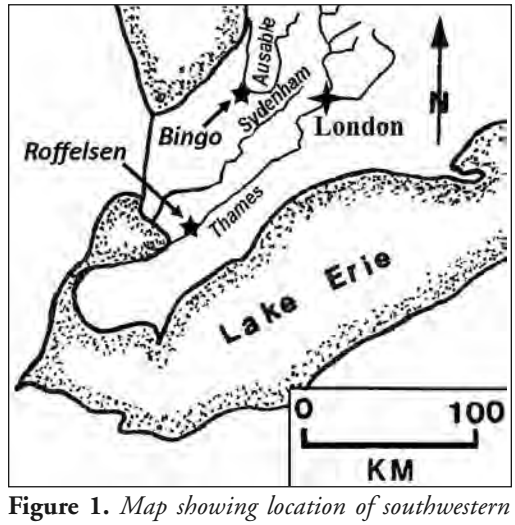

Figure 1. *Map showing location of southwestern Ontario sites discussed in the text.*

Ceramic vessel form and decoration are ambiguous in this respect, while house form in Bingo Village may suggest some Glen Meyer influence. Our concern here is primarily with the mortuary practices of the Bingo Village people and what those practices can tell us about their identity and social structure.

The archaeological consulting firm of Archaeologix Inc. (later absorbed by Golder Associates Ltd.), excavated a number of the Arkona cluster sites, with Jim Wilson as project director and Arthur Figura as field director. Among these was Bingo Village, excavated in 2007–2008 (Golder Associates 2012). A number of mortuary features were identified in the course of the excavation. Spence (2013a) conducted surface examinations of these. Their disposition was deferred until an agreement could be reached between the landowner, Van Bree Enterprises, and the appropriate First Nation, the Kettle and Stony Point First Nation. Although the mortuary features were being protected in the interim, it was apparent that the sandy soil of the site was unstable, leaving the features vulnerable to exposure and destruction. The decision was made to exhume the human remains and rebury them in a special cemetery nearby.

The consulting firm Brandy George Cultural Research Inc., directed by George, conducted the exhumations over several days in 2011, with Spence acting as bioarchaeologist. The excavation team included George, Spence, Luis Machinho, Cindy Henry, and members of the Kettle and Stony Point Burial and Repatriation Committee, namely, Mike Henry, Patricia Shawnoo, Bernard George, and Jason Henry. Mike Henry and Patricia Shawnoo conducted rituals before and during the exhumations to reassure the Ancestors and protect the excavators.

One burial, Feature 1 (F1), had been moved in 2007. That work was directed by Greg George, Heritage Official for Kettle and Stony Point First Nation, after Spence had done a surface assessment of the feature.

Analysis of the recovered skeletal material was done in the field, in the course of the excavation. Analytical techniques were adapted to suit the field conditions. Sex was determined primarily by pelvic characteristics (Buikstra and Ubelaker 1994; Phenice 1969). Adults were aged in most cases by the auricular method described by Osborne et al. (2004) or by the symphysis pubis method of Suchey and Katz (1998). Juveniles were aged by long bone dimensions (Forrest 2010; Merchant and Ubelaker 1977; Saunders and Spence 1986; Scheuer and Black 2000; Ubelaker 1978: Table 5), epiphyseal fusion (Baker et al. 2005; Scheuer and Black 2000), and dental development (AlQahtani et al. 2010; Moorrees et al. 1963; Trodden 1982; Ubelaker 1978: Figure 62). The few measurements taken were primarily of juvenile and infant skeletal elements, to assist in age determination. Details on the age and sex identifications are presented in an earlier report (Spence 2011a).

Many of the bones were examined for cutmarks using a hand glass, although time did not allow a thorough analysis of cuts. Skeletal elements were identified as specifically as possible, but again, time and conditions did not permit the precise identification of some elements, particularly lesser ones, such as the bones of the hands and feet. This was particularly true of F164, from which 294 skeletal elements and 31 teeth were recovered.

Southern Ontario Burial Practices

Burial practices in the Late Woodland period of southern Ontario were complex, involving at least two steps (Creese 2016; Spence 1994; Williamson and Steiss 2003). First, the deceased was given a "primary burial" at or shortly after death. Then, after a period that could be from a few months to a decade or more, the primary burial would be exhumed and the remains transferred to a "secondary burial." This reburial usually included more than one person because more than one individual in the community would have died and received a primary burial since the previous exhumation and reburial event.

The deceased were rarely reinterred as complete bodies in the secondary burial. There would have been some decomposition in the primary burial. Some body segments, skeletal elements, and teeth may have separated from the

corpse with decomposition, to be overlooked or ignored during the exhumation. In particular, peripheral elements, such as the bones of the hands and feet, and the single-root anterior teeth that often fall from the cranium and mandible when the soft tissues holding them in place deteriorate, can be overlooked.

Beyond these losses, there was often some further selection of elements for the reburial. The cranium, mandible, and long bones of the arms and legs were usually included in the secondary burial (Spence 1994). Other elements, such as the ribs and vertebrae, innominates, scapulae, and hands and feet, seem to have been more optional inclusions. Perhaps the degree to which they were still encased in soft tissue and attached to the rest of the body was a factor in these decisions. In some cases, there are cutmarks on some bones, indicating their deliberate detachment or defleshing.

There are thus three types of feature that are products of the mortuary programme typical of Late Woodland societies: the primary burial, the secondary burial, and the "sorted deposit" (Spence 2011b). The primary burial is generally easily recognized by the presence of a single, fully articulated and complete skeleton in the feature. The secondary burial is characterized by the incomplete and at least partially disarticulated skeletons of more than one person, with a bias toward crania, mandibles, and long bones.

The "sorted deposit" is a more ambiguous feature. It contains the remains that had been sorted from the exhumed primary burial but excluded from the secondary burial. This selection process may have been guided by certain culturally based understandings of what elements were important, but was also probably influenced by other factors, such as the degree of decomposition, and quite likely even by archaeologically inaccessible considerations, such as the wishes of the surviving kin (Creese 2016:354).

A sorted deposit is not easily characterized. The kinds of elements present in the feature will offer a good indication, although they may be quite variable, but then there are further questions about the nature of the feature. It might have been the original burial pit for the exhumed primary burial, a different feature prepared specifically to hold the sorted remains, or a conveniently open storage or refuse pit into which the remains could be deposited. Coupled with these possibilities is the question of whether the remains still retained some meaning or sanctity, or whether they were just considered insignificant material to be discarded.

This reconstruction of burial practices overlooks a number of variations and special sites (e.g., Molto et al. 1986), and is based largely on Ontario Iroquoian data. Furthermore, it primarily reflects the later phases of the Ontario Iroquoian tradition. The earlier mortuary practices of the Glen Meyer phase, although following the same general pattern, seem to have been more variable, often differing from one community to the next (Spence 1994).

Iroquoian archaeology in Ontario has generally dominated research, with Western Basin tradition sites receiving much less attention (Ferris and Spence 1995). It thus remains unclear to what degree this model fits Western Basin burials, which seem to have been highly variable (Murphy and Ferris 1990; Spence et al. 2014). The primary-to-secondary burial sequence has been identified in some Younge phase sites in southwestern Ontario (Dewar et al. 2010; Fox 1982; Murphy and Ferris 1990: 266; Watts et al. 2011), and it was clearly present in the Arkona sites. Some of the burials in Michigan sites have been termed "torso burials," characterized by the presence of an articulated torso in the feature, perhaps with some additional elements, such as the patellae, but without the elements of the head, arms, or legs. Speal (2006) has identified these as the remnants, left *in situ*, of primary burials from which the missing elements had been removed for secondary burial. Some examples also occur in the Arkona cluster.

Two types of cranial modification are common in Western Basin sites: drilled holes and cranial disks (Greenman 1937; Speal 2006; Spence et al. 2014). The drilled holes are small and appear on the anterior part of the cranium, usually on the midline, just anterior or posterior to bregma. The cranial disks, on the other hand, are larger and had been removed by cutting the

posterior part of the crown, either at or just anterior to lambda. As we will describe below, cranial disk removal was practiced frequently at Bingo Village, but only one drilled hole, in F(eature)164C, was found.

The Architectural Environment

The built environment of a mortuary feature is important in the reconstruction of the community's mortuary programme. Relevant questions are whether the feature is inside or outside the community's palisade, and if within the palisade, whether it is inside a house or in an exterior area. In the case of an in-house burial, it is helpful to know its location with respect to other features. For example, is it is in the living area or in the unoccupied storage area that is sometimes present at the end of the house? These data may permit some insight into the social contexts for various mortuary events, identifying who in the community was involved in the ritual as participant or audience (Spence 2011b).

Bingo Village was a palisaded village of the late Younge phase, with a north–south diameter of 45 m and an east–west diameter of 65 m. Within the palisade were four houses, each with living space for two or three families (Figure 2). A large open area, about 12–15 m north–south by 15 m east–west, took up much of the south-central part of the village. It was bordered on the west and north sides by houses and on the south and east sides by lines of posts. This area was probably a public one, a plaza, used by the people of Bingo Village for both daily activities and rituals. House 1 forms its western side, House 2 its northern end. To the east of the plaza is another, smaller open area, expanding to the south to a maximum of about 13 m east–west. Its eastern border is formed by House 3. House 4 is to the east of House 3, parallel to it, at the eastern edge of the village.

Small structures were also associated with some of the Bingo Village mortuary features. They are visible as a series of 4–12 postholes around the

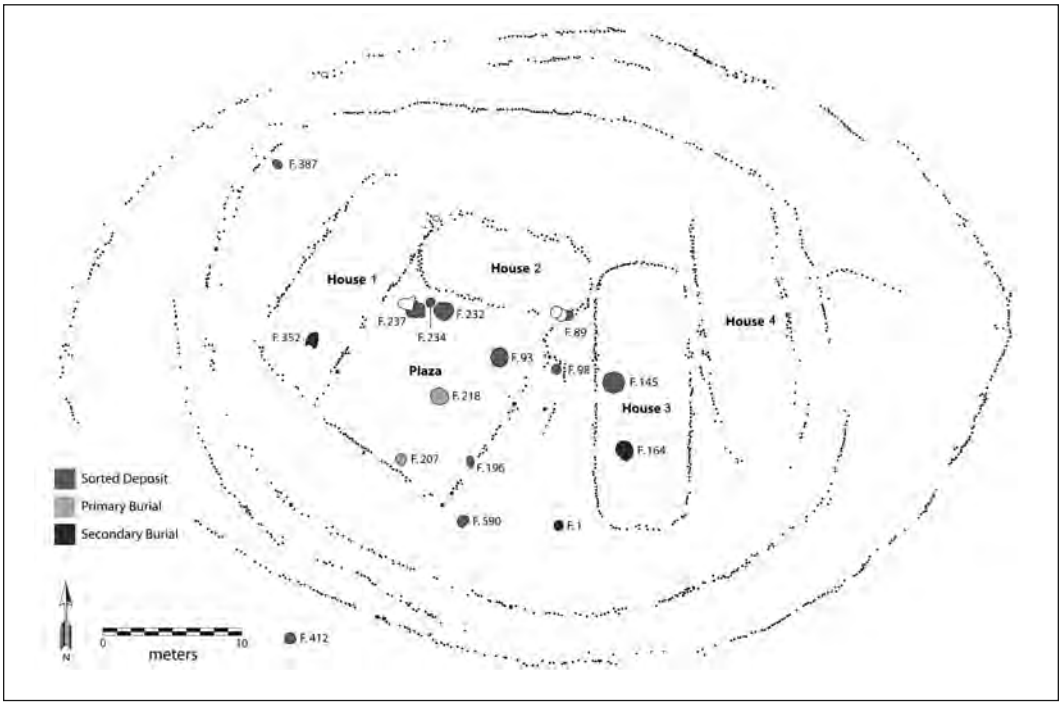

Figure 2. *Plan of the Bingo Village showing mortuary features. Note that some posts have been omitted to more clearly present the principal patterns. Map by Chris Watts.*

perimeter of the feature (Figures 3–4). The post profiles are vertical, so we might be dealing with either a fence encircling the feature or a cover supported by the posts. These structures might be jiibiigumig, or spirit houses, places where the living and the dead could meet to communicate and share food (personal communication, August 2011, Michael Henry). To avoid inferring a function, we shall refer to them simply as "enclosures." In two cases, no enclosure was present, but a pair of postholes at the edge of the feature indicated the presence of some sort of marker or sign.

The 16 mortuary features of Bingo Village are described below, organized in terms of their role in the mortuary sequence (Figure 2). Summary data are provided in Table 1.

Table 1. *Bingo Village mortuary features.*

Feature	Burial Type	Location	Individual(s)	Associated Structure(s)
1	secondary burial	open area	A: 13–15 yr B: 7–9 yr C: 11–14 yr	paired posts
89	sorted deposit	plaza	adult	–
93	sorted deposit	plaza	1–3 yr	enclosure
98	sorted deposit	open area	13–16 yr	enclosure
145	sorted deposit	House 3	female, 44–74 yr	none
164	secondary burial	House 3	A: male, 30–45 yr B: male, 15–17 yr C: 11–12.5 yr D: 10–11 yr E: 7.5–8.5 yr F: 3–4 yr G: perinatal	paired posts
196	sorted deposit	plaza	male, 39–67 yr	enclosure
207	primary burial	plaza	female, 20–23 yr	enclosure
218	primary burial	plaza	female, 20–23 yr	none
232	sorted deposit	plaza	adult	–
234	sorted deposit	plaza	female, 34–61 yr	none
237	sorted deposit	plaza	infant	none
352	secondary burial	House 1	A: female, 34–61 yr B: 6–7 yr	none
387	sorted deposit	village margin	3–4 yr	none
412	sorted deposit	outside village	A: 2 mo–1 yr B: 1 yr	none
590	sorted deposit	open area	A: 14–16 yr B: 14–18 yr	enclosure

Unexhumed Primary Burials

Only two features held primary burials that had not been exhumed for secondary burial. Both of these were in the plaza, 4 m apart.

Feature 207

F207 was the unexhumed primary burial of a young woman. It was at the southern edge of the plaza, and the enclosure around it used the wall line forming the plaza's southern limit as part of its wall. The skeleton was on its right side in a tightly flexed position. It rested against the eastern edge of the pit, elevating the cranium and upper torso. The general orientation was east–west, with the head to the east, facing very slightly east of north. The legs were flexed tightly up in front of the torso. The arms were also flexed, placing the hands near each other, below the face.

A female sex identification is indicated by several pelvic traits. The third molars have fully developed and erupted. All the long bone epiphyses and the secondary epiphyses of the vertebrae and innominates have fused, but the medial epiphyses of the clavicles have not yet fused. That occurs between 16 and 34 years, and Webb and Suchey (1985: Table 5) say that an unfused epiphysis in females indicates an age of 23 years or less. The F207 woman, then, was probably in her early twenties at her death.

There are anomalous fusions in the lower vertebrae and hips. The fourth and fifth lumbar vertebrae have fused at their articular facets and bodies. The bodies are fused all around their circumferences. The line of fusion is not visible on the anterior surfaces, which have the squared appearance characteristic of vertebrae affected by ankylosing spondylitis (Ortner and Putschar 1985:411–415). The line of fusion is visible on the other surfaces and on the articular facets. There is also a bridging osteophyte on the right side of the bodies of the lumbar vertebrae (L4 and L5). There is no vertebra–rib fusion.

The sacrum is fully fused to the right innominate but still separate from the left innominate. The fusion on the right is complete enough so that there is no visible line of fusion. Broad and poorly defined grooves on the anterior and posterior surfaces mark the areas where the two elements joined. The bone around and across the fused area appears smooth.

The sacro-iliac fusion described above does not completely fit the criteria for ankylosing spondylitis. The fusion is not bilateral, and it appears to extend beyond the auricular surfaces (contrary to the characteristics described by Waldron 2009:57–60). On the other hand, on the left innominate there is a sacral facet in the area that on the right innominate has blended with the sacrum, so it is probably in an early stage of sacro-iliac fusion. Ankylosing spondylitis often starts at the sacro-iliac joint and proceeds cranially up the vertebral column, and eventually "establishes trabecular continuity between ilium and sacrum and completely effaces the joint" (Ortner and Putschar 1985:411). Since the disease starts in a person's twenties, the female in F207 is probably presenting an early stage of it.

Feature 218

F218 is another unexhumed primary burial of a young adult woman, also in the plaza but 4 m north of F207. There was no enclosure. The skeleton was tightly flexed on the left side, oriented with the head to the south and facing to the west. The legs were pulled tightly up in front of the torso. Both arms were also flexed, the right hand resting just above the knees and the left hand resting beneath the chin.

Cranial and pelvic indicators suggest that F218 is a female. The medial epiphyses of the clavicles are unfused. An age of 20–23 years seems most likely.

There is erosion and cavitation of the left auricular surface, but its aetiology is not clear. The right auricular surface also shows some deterioration, though less than the left. An early stage of ankylosing spondylitis is a plausible candidate (Ortner and Putschar 1985:411). Also, the mandibular left condyle is flattened, indicating some difficulty with the left temporo-mandibular joint. This area is sometimes affected by ankylosing spondylitis (Ortner and Putschar 1985:411).

Comments

These are the only primary burials in the village that had not been exhumed. There is no obvious reason for this anomalous treatment. It is not likely that they were just overlooked or forgotten, given the visible enclosure associated with F207. Although both are women, gender is probably not the cause for the difference in treatment. Another Bingo Village woman was found in a secondary burial (F352A). It is possible that these two women were outsiders, perhaps captives, who had not been fully accepted into the community and so were not included in the kin-based secondary burials. If both had ankylosing spondylitis, it may have led to a special status. There is abundant evidence that disabilities had an effect on burial treatment in Western Basin culture (Spence 1998; Spence et al. 2010, 2014). On the other hand, the ankylosing spondylitis may not have been developed enough to have had a noticeable effect. It is worth noting that ankylosing spondylitis has a strong genetic component in its aetiology (Waldron 2009:58). Perhaps the two women were related, and their anomalous treatment may stem in some way from that relationship and from an "outsider" status in the community.

Sorted Deposits

Most of the Bingo Village mortuary features are sorted deposits. These show considerable variation. Two (F89, F232) were only identified as mortuary features during the sorting of faunal material in later lab analysis, so information on the distribution of the human elements in them is not available and we cannot say whether they were associated with enclosures. In two other cases (F145, F387) the human bones were recognized in the field but only after they had been excavated, so again we have no data on their distribution in the feature.

It is important to determine whether or not a sorted deposit was also the original primary grave. This determination can be difficult. A variety of criteria can be assessed, although few of them are actually decisive. For one, the feature should be large enough to have held the complete body. Also, the presence in the pit of articulated segments (torsos, sets of ribs, etc.) is a good indicator of an exhumed primary burial. Lesser elements, such as bones from the hands and feet, loose teeth, and unfused epiphyses, are likely to have been left in the primary grave. Some refuse or other materials not associated with mortuary events might be expected, although it may be difficult to distinguish unrelated trash from the leftovers of a mortuary feast.

Feature 89

F89 was at the northeastern corner of the plaza, against the wall line of House 2 (Figures 2, 5). A number of human bones were found in the pit. All are probably from a single adult. They comprise:

1 left and 1 right patella
hyoid body and the unfused left cornu
left inferior articular facet of a lower thoracic vertebra
ends of spinous processes of 10 vertebrae (2 cervical, 6 thoracic, 2 lumbar)
7 parietal bone fragments
10 left and 9 right ribs

There are no cutmarks on the patellae, hyoid, or spinous processes. However, there are numerous cuts on the cranial pieces and ribs.

There are 19 ribs in the collection. Missing are the left and right first and second ribs and the right twelfth rib. Although fragmented, most of the ribs in the collection are nearly fully represented. The exception is the head and neck segment; only seven of these are present. In most cases the head and neck had been broken, not cut, off the rest of the rib. The discoloured surfaces of the breaks (i.e., they are the same colour as the adjoining cortical surfaces) indicate that the separation was not the result of recent damage.

There are cutmarks on all ten left ribs and on at least six of the nine more fragmented right ribs. All cuts are on the exterior surface or, in the more anterior (sternal) parts of the rib, on the superior edge. They are either transverse or oblique. In the eleventh and twelfth ribs, some cuts occur at the head, but in the typical ribs none occur in the head and neck segments, at least in those few that were found in the pit. Cuts start to appear

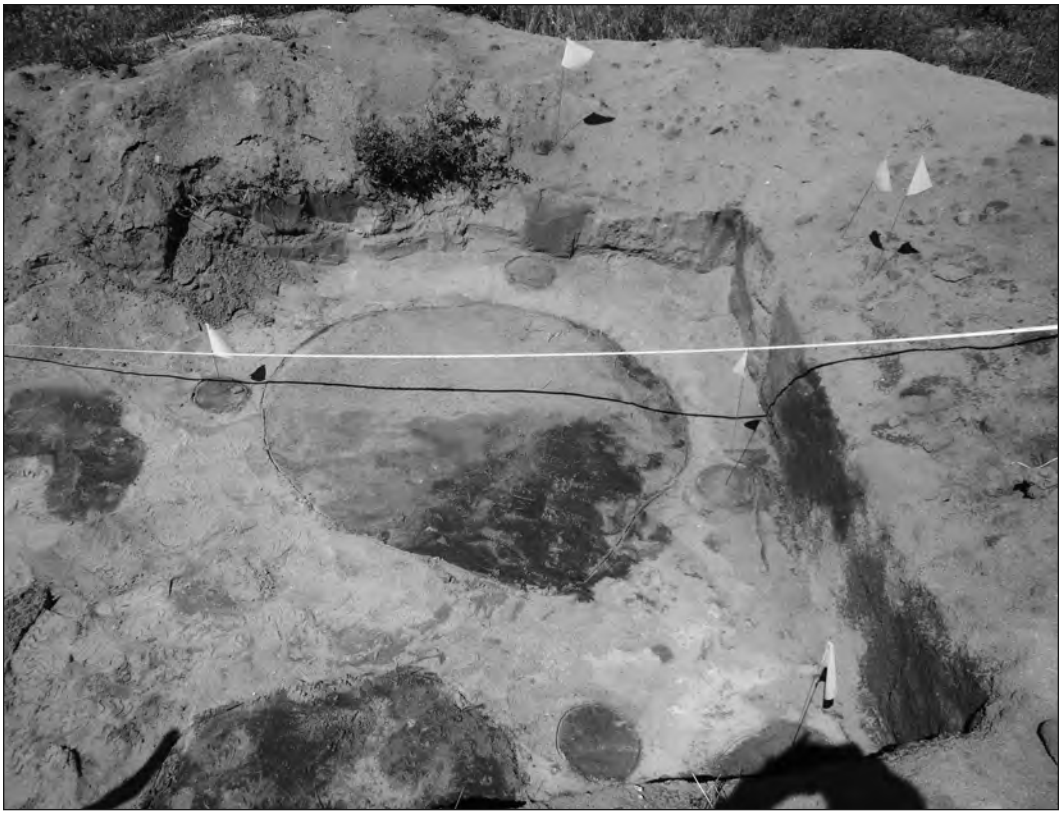

Figure 3. *Photo of F93 enclosure.*

immediately lateral to the neck tubercle and continue along the exterior surface, through the angle and up to a few centimetres beyond the angle. They become scarce to absent in the anterior (sternal) segment, occurring there only as scattered sets along the superior edges of some ribs. There are no cuts at the sternal ends.

The seven cranial pieces were conjoined into three, two of which articulated across the sagittal suture. The third fragment is also parietal, with a deeply scored and cut exterior surface, but it does not conjoin with the others. The main articulated segment includes the antero-medial parts of both parietal bones, with the coronal suture forming the anterior border and the sagittal suture running through the segment. The segment is irregular in form, 69 mm laterally and 53 mm antero-posteriorly. The edges (except for the coronal suture) are irregular and show that the segment was broken off from the rest of the cranium rather than cut from it. The surfaces of the breaks are discoloured, and the bone had separated unevenly, with the inner table projecting as a shelf in some places. The exterior surface of the segment has several cutmarks. There are also a number of broad, shallow spalls off it. Some of these spalls cross the sagittal suture, indicating that they were removed while the two parietal pieces were still well articulated. It is not known how they were removed, whether by deliberate blows or by some other force. The surfaces left by the spalls are discoloured, so they do not reflect a recent event. This cranial segment is not a cranial disk like those often found on Younge phase sites. It was not freed from the cranium by cutting, and it was located too far forward on the cranium, at bregma rather than at lambda.

The isolated small parietal piece (28 × 17 mm) may be a fragment from a disk, but this seems unlikely. The exterior surface bears the cut

Figure 4. *Photo of F98 enclosure.*

and scored lines characteristic of disks, but none of its edges have been created by cutting, and its precise location on the parietal is not known.

Because F89 was only recognized in later laboratory analysis, we are unable to say how the bones were distributed in the feature, whether or not there was an enclosure, and whether or not the feature had originally been the primary burial pit.

Feature 93

F93 was a sorted deposit located near the eastern edge of the plaza. It may also have been the primary burial pit, but the evidence is inconclusive. There was an enclosure with it (Figure 3). The only human bone in the F93 pit was part of a cranial disk, 27 mm long × 18 mm wide. The disk is incomplete, broken off lengthwise. An unidentified cranial suture forms one end. The long side opposite the break is formed by a long, arcing cut, with a bit of the inner table projecting beyond the cut at one end. The disk is thin, 4 mm thick at the suture but only 2 mm elsewhere. Although it is impossible to determine age precisely, its thinness suggests a young child, about 1–3 years old.

Feature 98

F98 was a sorted deposit in the open area east of the plaza (Figures 2 and 5), with an enclosure (Figure 4). A number of fragmented human bones were found in F98, scattered randomly through the feature, exhibiting no articulations. Some skeletal elements were represented only by fragments, for example, the distal ends of the left fibula and humerus, several innominate pieces, and the superior articular facet of a sacrum. The breaks are discoloured to the same degree as the adjacent cortical surfaces. This evidence, and the absence of the major parts of these elements, indicates that the breakage occurred during the

original exhumation of the primary burial. There are three diagonal cutmarks on the dorsal surface of a hand proximal phalanx.

The material from F98 includes: 3 cervical vertebrae (C3–5), 1 lower thoracic, the unfused ring of a thoracic, 3 small rib fragments, 1 small femur shaft piece, 1 small ulna shaft piece, the proximal end of a right ulna, the distal end of a left fibula, the distal end of a left humerus, 8 innominate fragments, a piece of humerus or femur proximal epiphysis, the distal end of a metacarpal, two hand phalanges (1 proximal and 1 middle), and 4 permanent anterior maxillary teeth (the left incisors and canine and the right lateral incisor). There are no element duplications, and all seem to be of a single person. The level of fusion of several elements suggests an age of about 13–16 years (Scheuer and Black 2000). Unfortunately, none of the F98 bones are suitable for sex identification. The feature had probably also served as the primary burial pit.

Feature 145

F145 was a sorted deposit located in the residential space of House 3 (Figures 2 and 5). There was no enclosure associated with it. The pit contained a considerable quantity of mammal bone, most of it white-tailed deer (*Odocoileus virginianus*), and the left and right innominates of an adult human. Unfortunately, the innominates had been removed from their original positions before they were recognized as human, so it is not possible to determine whether or not this was also the primary burial location. The deer bone, which was not separate from the human elements in the deposit, may have been from a feast associated with the mortuary events.

The two innominates are of the same person, a female. The auricular area is in phase 6 of Osborne et al. (2004), which is assigned an age of 58.9 ± 15.24 years. There are no cutmarks on either innominate.

Feature 196

F196 was located in the plaza, near an opening in the wall that formed the eastern edge of the plaza. It had an enclosure. The pit held a "torso burial," the remnants left behind of an exhumed burial. Although classified as a sorted deposit, this feature was certainly also the primary burial pit.

The principal material in F196 was the lower part of a torso: an articulated set of seven vertebrae (eleventh thoracic through fifth lumbar), the sacrum and coccyx, and the left and right innominates. The segment was supine, with the cranial end oriented to the south. On and around these elements were some disarticulated bones from both feet. About 30 cm east of the eleventh thoracic was a cluster of other disarticulated elements which included hand and foot bones and some innominate and scapula fragments. A cluster

Table 2. *F196 inventory of skeletal elements.*

Element	Number Present
clavicle	1L, 1R
scapula	1L, 1R
innominate	1L, 1R
cervical vertebra	5 (including atlas, axis)
thoracic vertebra	9
lumbar vertebra	5
sacrum	1
coccyx	1
rib	1L, 1R first ribs, 3 small fragments of other ribs
patella	1
pisiform	1L, 1R
lunate	1L, 1R
capitate	1L, 1R
hamate	1L, 1R
scaphoid	1R
trapezium	1R
triquetral	1R
trapezoid	1L
metacarpals	all present
hand phalanges	10 proximal, 8 middle, 7 distal
tarsals	all present
metatarsals	all present
foot phalanges	9 proximal, 7 middle, 5 distal

of four disarticulated hand phalanges (1 proximal, 1 middle, 2 distal) and the broken vertebral end of a rib rested 25 cm south of the torso segment, in a location that would have been appropriate for one of the hands if the arm had been flexed. The break in the rib is old, its surface being discoloured to the same degree as the adjacent cortical surface. Other disarticulated bones were scattered around the pit. No teeth were present. A full list of recovered bones is presented in Table 2.

All the bones are of a single adult, a male. The auricular surfaces conform to phase 5 of Osborne et al. (2004), which has an age of 53.1 ± 14.14 years.

Three of the lumbar vertebrae have compressed fractures, in the case of the fifth lumbar crushing the body down to a height of 11 mm. The left clavicle has cutmarks, but there are none on the innominates or scapulae. Cutmarks also appear on the palmar surfaces of both first metacarpals and the dorsal surfaces of both fourth metacarpals, and on the right third metatarsal. The absence of cutmarks on the innominates shows that there had been some decomposition during the period of primary burial, but the cutmarks on the other bones indicate that the decomposition had not been complete.

The bones retained for the secondary burial included the cranium, mandible, and long bones of the arms and legs. The ribs, with the exception of the first ribs, were also removed from the primary burial pit, although most of the vertebrae were placed back in F196 (Table 2). The separation of ribs from vertebrae may have required some force, to judge by the ancient appearance of the fracture on one rib fragment. Body segments that were excluded from the secondary burial included the clavicles and scapulae, the vertebral column, the pelvic girdle, and the hands and feet.

Feature 232

F232 is one of a cluster of three mortuary features in the northwestern part of the plaza. There are seven human bones from F232, all from the foot (or feet) of an adult. They include the right cuboid, right navicular, ray I metatarsal, ray I proximal phalanx, a metatarsal shaft, and two proximal phalanges (from rays II or III). All are probably of the same adult. Given its large size, F232 had probably been the original primary burial pit. If so, the foot bones may be elements that had been overlooked during the exhumation. Because F232 was only identified during later laboratory analysis, we are unable to say whether or not it had an enclosure or other associated features.

Feature 234

F234 was another sorted deposit in the northwest of the plaza, part of the same cluster as F232 and F237. There was no enclosure. We cannot say whether or not it had also served as the primary grave.

F234 held a number of scattered and disarticulated elements, all from a single adult. Present were part of a right innominate, parts of six left and two right ribs, one cervical and one thoracic vertebra, and a left second metacarpal. None has cutmarks. The innominate has a very wide sciatic notch and a preauricular sulcus, indicating a female. The auricular area is phase 4, with an age of 47.8 ± 13.95 years (Osborne et al. 2004).

Feature 237

F237 was the third sorted deposit of this cluster in the plaza. It had no associated enclosure, but its size and contents suggest that it had been the primary burial pit. There were seven articulated left ribs and a cranial disk in F237. None of the ribs have cutmarks. Their size indicates an infant, probably between birth and a couple of months in age.

The cranial disk is 32 mm long × 22 mm wide, though a small part of its length had broken off and was not recovered. An unidentified suture forms part of one end. The edges are cut, with a small tab of the inner table protruding beyond the cut at one point. There are also cutmarks on the external surface, with some dense back-and-forth sawing cuts at one end of the disk.

Feature 387

F387 was a sorted deposit located in an open area at the northwestern edge of the village, but

isolated from the rest of the village by the intervening House 1 (Figure 2). The pit was 0.5 m inside the inner palisade and 5.5 m from an opening in the west wall of House 1. Its contents indicate that it had been the primary burial feature. There was no associated enclosure.

Several human skeletal elements were found at the base of the F387 pit, but all had been displaced from their original context before it was realized that they were human. There were six right and three left ribs, but no vertebrae, and a cranial disk. The size of the ribs suggests an age of about three or four years.

The disk was in pieces. Its dimensions are approximately 9 × 5 cm, but its form could not be determined. There are cutmarks over most of the external surface, some of them showing the back-and-forth movement of sawing, and one more deeply scored cut with striations within its track. This latter runs parallel to one curved edge of the disk and probably represents part of the cut that separated the disk from the cranium. The sagittal suture is recognizable on some of the fragments.

Feature 412

F412 was a sorted deposit outside the village, 3.5 m south of the outermost palisade line. There was no enclosure. The arrangement of the bones in the pit indicates that it had been the primary burial pit for both of the people in it.

There were two sets of infant bones. On the western side of the feature there was a set of nine articulated right ribs (individual A). Their orientation indicates that the torso segment was lying prone, with the cranial end oriented to the southwest. At the southwestern end of the segment was a cranial disk. Rib dimensions suggest an infant older than a newborn but still under 1 year in age.

About 8 cm to the east of this infant was another set of articulated ribs, seven left and eight right (individual B). This torso segment was also prone, but with the cranial end to the northeast. Southwest of it was a second cranial disk and, just west of the disk, metatarsals II and V. One hand phalanx was also present. Size indicates that all these elements are from an older infant, about 1 year of age. There are no vertebrae from either infant in F412, so these, the crania and mandibles, the long bones, and virtually all of the other bones had apparently been reburied somewhere else.

The disk of the younger infant (A) is 56 mm in diameter. The sagittal suture runs down the centre, but the lambdoidal suture is not present on the disk. B's disk is circular, 70 mm in diameter, also with the sagittal suture across the centre. The left parietal foramen is visible. The posterior edge is still anterior to lambda, so again none of the lambdoidal suture is included in the disk. Cuts and scoring parallel the convex edges, and at one point the inner table extends irregularly up to 12 mm beyond the cut edge.

Feature 590

F590 was a sorted deposit located in the open area east of the plaza, only 0.5 m east of the southeastern corner of the plaza (Figure 2). There was an enclosure with it. The size and contents of the pit indicate that it had also been the primary burial feature for at least one, but perhaps not both, of the two people represented in it.

A number of skeletal elements and teeth were found in F590 (Table 3), but there were no articulations among them. The presence of two left lunates and two right clavicles indicates that two people were represented in the feature. We shall identify them as A and B, although the data do not allow their separation into actual individuals. The clavicles are about the same size, and both have unfused medial epiphyses, so both individuals are probably under 22 years (Webb and Suchey 1985:462, Tables 1–2). The annular epiphyses of the cervical and thoracic vertebrae are in the process of fusing, suggesting an age of about 14–16 years. The heads of the metacarpals are newly fused, a process that occurs at about 14.5–16.5 years (Scheuer and Black 2000:338). Also present are matching left and right unfused distal femoral epiphyses, unfused left and right distal ulna epiphyses, and the unfused distal epiphysis of a right radius. If all of these were of the same person, an age of about 14–16 years would seem likely. However, the two individuals are roughly similar in age and size, so it is impossible to say with certainty which bones belong to which

Table 3. *F590 inventory of skeletal and dental elements.*

Element	Number Present
dental–maxilla	1 canine, 3 premolars, 1 molar
dental–mandible	1 canine, 2 premolars
clavicle	1L, 2R
manubrium	1
cervical vertebra	5 (including atlas, axis)
thoracic vertebra	1
rib	5 fragments representing parts of at least 2 ribs
unfused distal radius epiphysis	1R
unfused distal ulna epiphysis	1L, 1R
unfused distal femur epiphysis	1L, 1R
pisiform	1R
lunate	2L, 1R
capitate	1L, 1R
hamate	1L
scaphoid	1R
trapezium	1L, 1R
triquetral	1R
trapezoid	1R
first metacarpal	1L, 1R
second metacarpal	1L, 1R
third metacarpal	1R
fourth metacarpal	1L, 1R
fifth metacarpal	1R
unidentified metacarpal	1
hand phalanx	6 proximal, 8 middle, 7 distal
calcaneus	1L, 1R
talus	1L, 1R
navicular	1L, 1R
cuboid	1R
first cuneiform	1L, 1R
second cuneiform	1L, 1R
third cuneiform	1R
second metatarsal	1L
third metatarsal	1L, 1R
fifth metatarsal	1L
foot phalanx	4 proximal, 1 distal

individual. All that can be said is that one youth (A) is about 14–16 years old, and that the second person (B) is between 14 and 22 years, and probably in the younger part of that range, roughly 14–18 years. Sex identification is not possible with the available elements.

Both crania and mandibles, all the long bone diaphyses, all the innominates and scapulae, and most of the ribs and vertebrae of the two individuals are missing from F590. Hand and foot elements, in contrast, are fairly well represented. F590, then, is neither a primary nor a secondary burial, but, rather, the elements left from sorting two primary burials to prepare them, or parts of them, for secondary burial. This process involved some cutting with both individuals, as seen by the presence of cutmarks on both of the right clavicles. Cutmarks are also present on the dorsal surface of left metacarpal I and on the palmar surfaces of right metacarpals II and III. None appear on the metatarsals.

The human bone was in the western part of F590. The eastern part held a dense deposit of a variety of materials. There was a large quantity of non-human bone, much of it deer but also some fish and rodent. Parts of at least 5 ceramic vessels, 8 pipes (2 of stone), 4 complete projectile points (3 of chert, 1 of antler) and a small, well-made celt were present. There were also charcoal, charred maize, chert detritus, and a ground stone tool. Two pieces of micaceous schist were present, one (37 × 31 × 11 mm) with a great deal of silver mica and the other (16 × 11 × 11 mm) with gold mica. This large deposit may be a mixture of grave offerings and the remnants of a feast associated with either the primary burial event or the preparation of the two individuals for secondary burial.

Comments

Several of the sorted deposits may also have been primary burial features. This is certainly true for F196, F387, and F412, and probably for F98, F232, F237, and F590. In the cases of F89, F93, F145, and F234, it may also be true, but the evidence is not clear. There are no sorted deposits that we can be confident had not also been primary graves.

None of the sorted deposits had paired posts on their peripheries. However, enclosures were present with F93, F98, F196, and F590. They were absent with all the other sorted deposits for which we have evidence, but with F89 and F232, we were unable to say whether or not they were present. The presence of enclosures in some sorted deposits might be taken to indicate that the skeletal material in those deposits, which included cranial disks, still had some meaning or sanctity for the people of Bingo Village even though it had not been transferred into a secondary burial. Some investigators believe that the cranial disks held some spiritual significance or power (Murphy and Ferris 1990:270; Redmond 1982:24–25). The evidence, however, suggests that disks and the other sorted material were just discarded (Speal 2006; Spence et al. 2014:123). The enclosures may have been meant to protect or mark the primary graves, not the subsequent sorted deposits. Note that F207, which also had an enclosure, was an unexhumed primary burial.

The features with enclosures were all in the eastern part of the plaza and the adjoining open area to its east. Openings in the east wall of the plaza and in the west wall of House 3 would have allowed free movement from House 3 through the open area and into the plaza. It is possible, then, that the encircling structures were creations of the House 3 (and perhaps House 4) people for the protection or memorialisation of the primary burials of deceased house members.

The cluster of three features in the northwestern part of the plaza (F232, F234, F237) could have been associated with House1 and/or House 2. The northwestern corner seems to have been partially separated from the rest of the plaza by an irregular line of posts. F387 may also have been associated with House 1 and F89, with House 2. Although we cannot say whether or not F89 and F232 had enclosures, it is clear that none of the other mortuary features near houses 1 and 2 have them.

Secondary Burials

There were three secondary burials in Bingo Village, all with multiple individuals. None of

them had enclosures, but two (F1, F164) had a pair of posts on their margins. Another secondary burial (Location 10 F5A) was found a short distance east of the village and probably should be treated as one of the village mortuary features, but it will be described separately below.

Feature 1

F1 was the multiple secondary burial of three individuals identified here as A, B, and C. The mortuary feature was in the open area east of the plaza, 3 m from a gap in the south end of House 3 and 6 m east of F590 (Figures 2, 5). There was a pair of postholes just beyond its southwestern edge. The feature received a surface assessment but was removed intact to the reburial cemetery, so we know nothing of what lay beneath its uppermost layer. The count of three individuals is thus a minimum. For example, the surface assessment of F164 (see below) indicated four individuals, but on excavation the feature proved to hold seven people (Spence 2013a).

All three people were subadults. Each was placed in a different sector of the pit, forming a distinct deposit, but no great care had been taken to separate it completely from its neighbours. In a few cases it was not possible to be sure with which of the three juvenile crania a particular set of postcranial bones belonged. The long bones had been placed in clusters, the bones within each cluster generally parallel with one another. There were from one to three such clusters with each individual. Other elements (ribs, vertebrae, etc.) were dispersed around the long bone clusters. The crania had been placed at the perimeter of the pit, at the outer edge of each individual deposit.

There were no articulations among any of the visible bones. However, in a few cases the epiphyses of long bones were still in proper articular position with the shafts, though bony fusion to the shafts had not yet started. This suggests that there was still some soft tissue present when those elements were placed in the pit. Nevertheless, given the absence of any inter-bone articulations, the amount of soft tissue must have been minimal. Either the three individuals had undergone extensive decomposition in their primary burials or they had been extensively defleshed and disarticulated before their reburial together in the pit. Only a few bones could be examined for defleshing and disarticulation cutmarks (three humeri, one tibia, and one fibula). None were present. The frontal and parietal bones of individual B, the frontal bone of A, and the occipital bone of C could also be examined, and none of these have cuts. It is possible that a more thorough study would have revealed some cutmarks in the assemblage, but it seems likely that much of the disarticulation was the result of decomposition. No evidence of carnivore or rodent gnawing was seen on the bones.

Individual A was at the northern end of the pit. The cranium rested upright, oriented to face northeast. It was sitting on a cluster of parallel long bones that included at least both femora and a tibia. To the east of these was another cluster, with a radius, a humerus, and an unidentified long bone, with a metatarsal lying across them. It is not clear whether this cluster was with A or B. Also visible in this sector of the pit were another radius, three lumbar and two thoracic vertebrae, a broken mandibular condyle, some ribs, an unfused proximal tibia epiphysis, an unfused proximal femur epiphysis, and a clavicle. Still other elements were probably present but concealed beneath the visible bones.

Some of individual A's maxilla was visible, allowing a dental assessment of age (Spence 2011a). Individual A was probably 13–15 years of age at death. Long bone epiphysis fusion suggests a similar age. Unfortunately, sex in a person this young cannot be determined through skeletal analysis.

The cranium of individual B was sitting at the northeastern edge of the pit, facing east and slightly down. Both femora and the right humerus rested nearby. Also in B's sector of the pit were a sacrum, a scapula, some ribs, and some unidentified elements. B's maxillary dental development and epiphyseal fusion suggest an age of 7–9 years.

Individual C was in the southeastern sector of the pit. The cranium rested on its face at the southeastern edge of the feature, facing down and a little to the left, with its apex to the northeast. Other elements in this sector of the pit were both

femora, the left humerus, the left tibia and fibula, the first and second cervical vertebrae, a scapula, and two thoracic vertebrae. It was not possible to assess dental development because of the position of the cranium, nor was it possible to measure any of the long bones without displacing them. However, visual assessment of their size and development indicates that individual C was another juvenile. The state of fusion of the humerus epiphyses suggests an age of 11–14 years.

The positioning of the bones of all three individuals suggests that they had been placed in the pit by hand, rather that being deposited in bundles. The long bones may have been placed as handfuls, with perhaps two or more handfuls for each person. Although the bones of each person occupied a separate sector of the pit, with their crania placed at the outermost edge of each sector, there were some contacts and overlaps between the bones of adjacent sectors, indicating that maintaining separation among the three children was not of great concern to those conducting the burial ritual. Probably the degree of separation that did occur simply reflects their transfer from separate primary burial locations.

None of the three crania has had a disk removed from it. Neither A nor B has a drilled hole. However, the position of C's cranium did not allow observation for the presence of a drilled hole.

Only one bone from the hands and feet was visible, a metatarsal. No pelvic elements were seen, and the mandibles were represented by a single, broken condyle. Only 9 of an expected 72 vertebrae and 15 of an expected 36 long bones were observed. However, many elements were probably buried more deeply in the pit. Since the burial was transferred as a unit to the reburial site, no further observations were possible.

Feature 164

F164 was a multiple secondary burial located in the residential space of the same house as F145, 3.5 m south of F145 (Figure 5). There was no associated enclosure, but a pair of postholes on the eastern edge of the pit indicates the presence there of some sort of marker. The initial surface examination in 2008 suggested that F164 was the secondary burial of four individuals: an adult male, a teenage male, and two children. The 2011 excavation and analysis confirm that it was a secondary burial but raise the number of individuals to seven (Tables 1, 4-5; Spence 2013a): an adult male (individual A), a teenage male (B), four children of varying ages (C–F), and one infant (G). The ages of all but individual A were determined by dental development, long bone dimensions, and the state of epiphyseal fusion (Spence 2011a).

In the centre of the feature were three crania sitting upright together, virtually touching one another. There were a number of infant, child, and adult bones beneath and around them, and a large (75 × 49 × 37 mm) chunk of a clay mineral with a soft core of yellow material was beneath the posterior part of one cranium. It was probably an offering (see below). The crania were of individuals B, C, and E. Individual C's cranium faced slightly west of north. It has a drilled hole 9 mm in diameter on the sagittal suture, its anterior edge only 2 mm posterior to bregma. The hole extends completely through the bone. This example was the only case of a drilled hole in the Bingo Village series, although they are common enough in other Ontario Younge phase sites (Spence et al. 2014). No cranial disk had been removed. Dental and skeletal development indicate an age of 11–12.5 years. Individual B's cranium was immediately to the south of the other two and faced west. There was no drilled hole or cranial disk removal. Individual B was a teenager, 15–17 years of age. The cranium of E was directly east of that of C and faced north. There was no drilled hole or disk removal. The age is 7.5–8.5 years. The only other cranium represented in the feature was that of G, the infant. It was very fragmented, its pieces widely distributed in the feature. It was not possible to say whether a disk had been removed or a hole drilled, but no cutmarks were seen on the recovered fragments.

The other skeletal elements in the feature had been placed around and beneath the crania. No part of the pit seems to have been reserved for any one individual. In each sector skeletal elements from at least three individuals were found mixed together. For example, at the southwest edge of

the pit there was a cluster of long bones from the same person, individual C. They had been placed in three pairs: the left and right fibulae, the left and right radii, and the left and right ulnae. Other elements in this area, however, were the innominates and scapulae of the teenager (B) and some elements from the infant (G). Also from here was an offering, a stone glittering with numerous quartz inclusions, very like the two from F352 (see below).

There were a few articulations in the feature. Two adult cervical vertebrae, the atlas and axis, were still articulated, as were two adult thoracic vertebrae nearby. Although the bodies of a child's sacrum (from individual C, D, or E) had not yet fused they were found together in order, with the unfused coccyx also in its proper position. A subadult calcaneus, of C or D to judge by its size, was lying with the posterior epiphysis in position but unfused. In two places, an ischium and the corresponding but unfused pubis were resting in position. The two sets belonged to different children, probably C and D.

Despite these suggestions of some surviving soft tissue, most of the unfused epiphyses in the feature were separated from their corresponding elements. These separations include not only all the major long bone epiphyses in the pit, but also the heads of the metacarpals and metatarsals and the proximal epiphyses of phalanges. All seven individuals were extensively or completely disarticulated. This disarticulation seems to have been largely due to decomposition in the primary burial environment, but in some cases the cutting of soft tissue was also involved.

Time did not allow the examination of all elements for cutmarks. However, the adult innominates, long bones, metacarpals, and metatarsal were examined, with no evidence of cuts. Of the teenager (B) only the cranium was studied; it showed no cuts. All of the long bones attributed to the children (C–F) were examined. None of the long bones of C (ulnae, radii, tibiae, fibulae) or F (right humerus, right femur, tibiae, fibulae) have cutmarks. However, both radii of D have long scraping marks running lengthwise along the shafts, and the right ulna has a cutmark on the posterior surface of the shaft. Both humeri of E bear cuts on the posterior surfaces of their distal metaphyses.

None of the seven individuals was represented by a full, or even nearly full, skeleton (Tables 4–5). For example, there were no mandibles in the feature, not even as small fragments, although some mandibular teeth were present. Skeletal elements of the adult (A) were recognized easily enough, as were those of the teenager (B) and infant (G). However, those of the four children (C–F) were often difficult to distinguish, and time and circumstances did not allow for their detailed identification. The dimensions and the degree of development of primarily long bones, but also a few other elements, did allow some assignment to a particular child. However, most of the subadult elements necessarily remain in a single large and undifferentiated category (Table 5).

Individual A is an adult male. The symphysis pubis is in phase IV, indicating an age of 35.2 ± 9.4 years (Suchey and Katz 1998). The auricular area is in phase 3, with an assigned age of 42.0 ± 13.74 years (Osborne et al. 2004). In general, an age of 30–45 years seems likely. Neither the cranium nor the mandible of A was present in F164. However, the levels of attrition on some maxillary and mandibular teeth from the deposit indicate that they are from the adult. Both innominates and scapulae are present, and all the long bones of the arms but none from the legs (Table 4). There are six vertebrae, one rib fragment, and several bones from the hands. These include seven proximal phalanges, so both the right and left hands are represented.

Individual B is a male teenager. Besides the cranium, B is represented by both innominates, both scapulae, the sacrum and coccyx, and one hand and four foot elements (Table 4). It is possible that some of the larger thoracic vertebrae with unfused secondary epiphyses that have been assigned to the general child category (Table 5) are actually of B, but this cannot be confirmed.

Individuals C–F, the four children, are close in age to one another, so it was usually not possible within the given time constraints to assign most of the subadult skeletal elements to any particular child. The four were distinguished primarily on the basis of long bone maximum lengths, which

Table 4. *F164 inventory of skeletal elements, individuals A–F.**

Element	A	B	C	D	E	F
cranium	absent	present	present	absent	present	absent
clavicle	absent	absent	L, R	absent	absent	absent
scapula	L, R	L, R	–	–	–	–
humerus	L, R	absent	diaphyses absent	diaphyses absent	L, R diaphyses	R diaphysis
radius	L, R	absent	L, R diaphyses	L, R diaphyses	diaphyses absent	diaphyses absent
ulna	L, R	absent	L, R diaphyses	L, R diaphyses	diaphyses absent	diaphyses absent
femur	absent	absent	diaphyses absent	diaphyses absent	diaphyses absent	R diaphysis
tibia	absent	absent	L, R diaphyses	diaphyses absent	diaphyses absent	L, R diaphyses
fibula	absent	absent	L, R diaphyses	diaphyses absent	diaphyses absent	L, R diaphyses
innominate	L, R	L, R	–	–	–	–
cervical vertebra	4	absent	–	–	–	–
thoracic vertebra	2	absent	–	–	–	3
lumbar vertebra	absent	absent	–	–	–	2
sacrum	absent	present	–	–	–	–
coccyx	absent	present	–	–	–	–
rib	1	absent	–	–	–	–
carpal	2	absent	–	–	–	–
metacarpal	2	absent	–	–	–	–
hand phalanx	13	1	–	–	–	–
tarsal	1	4	–	–	–	–
metatarsal	1	absent	–	–	–	–

** unassigned elements may go with individuals C–F (Table 5)*

were assigned ages on the basis of the Arikara data of Merchant and Ubelaker (1977; see also Ubelaker 1978:Table 5) and the data presented by Scheuer and Black (2000).

Individual C (11.0–12.5 years old) is represented by both radii, ulnae, tibiae, fibulae, and clavicles, and by the cranium (Table 4). One of the ischium and pubis sets may also go with C. For D (10.0–11.0 years old) there are both radii and ulnae, and perhaps the other ischium and pubis set. E (7.5–8.5 years old) is represented only by both humeri and the cranium. F (3.0–4.0 years) is represented by the right humerus, right femur, both tibiae, and both fibulae. The neural arches and centra of at least three thoracic and two lumbar vertebrae had not yet fused, so it is likely that these are also of individual F. There are also a large number of elements that we could not assign to any particular one of the four children (Table 5). The majority of these are vertebrae, unfused long bone epiphyses, and 126 bones (including unfused epiphyses) of the hands and feet. Of the latter, the ratio of hand to foot elements is about 3:1.

None of the four children is complete, or even largely complete. Some bones are represented in the deposit by unfused epiphyses, while the corresponding diaphyses are missing. For example, the four unfused distal femoral epiphyses are all too large to belong to the one recovered femoral diaphysis (individual F). Also, the four unfused proximal tibia epiphyses are too large for the tibia

Table 5. *F164 unassigned elements, individuals C–F.**

Element	Number Present
scapula	2L, 2R (2 sets)
unfused coracoid process	2
ischium	2L, 2R (2 sets)
pubis	2L, 2R (2 sets)
ilium	1L, 1R (1 set)
cervical vertebra	8
thoracic vertebra	24
lumbar vertebra	8
sacrum and coccyx	1
rib	5
unfused humerus conjoint proximal epiphysis	4
unfused radius distal epiphysis	2
unfused femur proximal epiphysis	4
unfused femur greater trochanter	2
unfused femur distal epiphysis	4
unfused tibia proximal epiphysis	4
unfused tibia distal epiphysis	4
unfused unidentified epiphysis	1
metacarpal/metatarsal diaphysis	30
unfused metacarpal/metatarsal epiphysis	13
carpal	17
tarsal	8
hand/foot phalanx diaphysis	42
unfused hand/foot phalanx epiphysis	16

* for assigned elements, see Table 4

diaphyses of F, although two of them may go with the C diaphyses. There are four conjoint proximal humerus epiphyses but only three humerus diaphyses. In contrast, there are four radius diaphyses but only two unfused distal and no unfused proximal radius epiphyses in F164. None of the unfused epiphyses of the four ulna diaphyses was present.

Individual G is a perinatal infant, represented by 38 unfused arch halves (including elements from the cervical, thoracic, and lumbar segments of the vertebral column), 17 vertebral bodies, the dens of the axis, an ischium, a pubis, both ilia, the left scapula, the right femur, 11 hand phalanges, and 8 metacarpals or metatarsals. Of the cranium there are the right temporal squama and petrous portion (unfused), left zygoma, pars basilaris, a pars lateralis, left greater wing of the sphenoid, and a few small unidentifiable fragments. The infant's bones, including the cranial elements, were scattered throughout the feature with no articulations. The absence of the mandible and all but one of the long bones is notable. Also, despite the good representation of elements from the vertebral column, not a single infant rib was present in F164. The length of the femur, 77 mm, suggests an age of 39 ± 2 fetal weeks, so individual G must have died at or very shortly after birth (Scheuer and Black 2000:Table 11.5).

Given the care taken in excavation, it is difficult to explain the erratic presence of elements in F164. In Ontario Iroquoian societies the practice was usually to retain the cranium, mandible, and long bones for the secondary burial, although some might occasionally be left out and other elements, such as the innominates and vertebrae, were frequently also included. F164 was clearly a secondary burial. However, the selection of elements for inclusion seems less patterned than in Ontario Iroquoian secondary burials. Although seven individuals are represented in the pit, there are only four crania and no mandibles at all. Nevertheless, teeth from some of the missing crania and mandibles were present. Also, the largest of the long bones, the femur, is represented by only 2 diaphyses (from the two youngest individuals) but by 10 unfused epiphyses. The other long bones are similarly underrepresented in F164. Particularly striking is the presence of fragments from only six ribs, one from A and five from the C–F children. As noted above, much of the infant's vertebral column was present but none of the ribs.

There were two probable grave offerings in F164. One was the stone of yellow clay material

beneath C's cranium. A similar material had also been placed with the burials of the Younge phase Roffelsen site near Chatham (Spence et al. 2014). The other offering is a stone with numerous quartz inclusions found in the southwestern part of the feature. As discussed below, the same type of stone appeared in F352, where it was certainly a deliberate inclusion.

Feature 352

F352 was the secondary burial of two people, an adult (A) and a child (B), in the residential area of House 1, to the west of the plaza (Figures 2 and 6). There was no enclosure or post pair. The child's dental and skeletal development indicate an age of 6–7 years. Individual A was a female. Her auricular area is in Osborne et al.'s (2004) phase 4, indicating an age of 47.8 ± 13.95 years.

The two crania rested on top of the deposit of bones, both facing northeast. B's cranium was at the western edge of the deposit, sitting upright, while that of A was on the eastern edge and upside-down, balanced on its vertex. Running between them was a set of articulated adult vertebrae, from the ninth thoracic through the fifth lumbar. The vertebral ends of four right ribs and one left rib were still articulated with the thoracics. The sacrum had been displaced in the initial testing of the feature, so it is impossible to say whether it had originally been articulated with the spinal segment.

At the northern edge of the deposit were the two adult innominates, resting together but not in articulation. However, the left femur was lying across the deposit, with its head very near the acetabulum of the left innominate. It had probably been in articulation with the innominate but had slumped out of position. The corresponding right femur and the right tibia of A were lying below the left femur. Beneath these were the two adult clavicles. A's mandible was lying beneath the cranium but not in articulation with it.

B is represented by only the cranium, mandible, two incomplete right ribs, and a large fragment of the right humerus diaphysis. The mandible was resting beside the cranium. None of the child's elements were in articulation and there were no cutmarks.

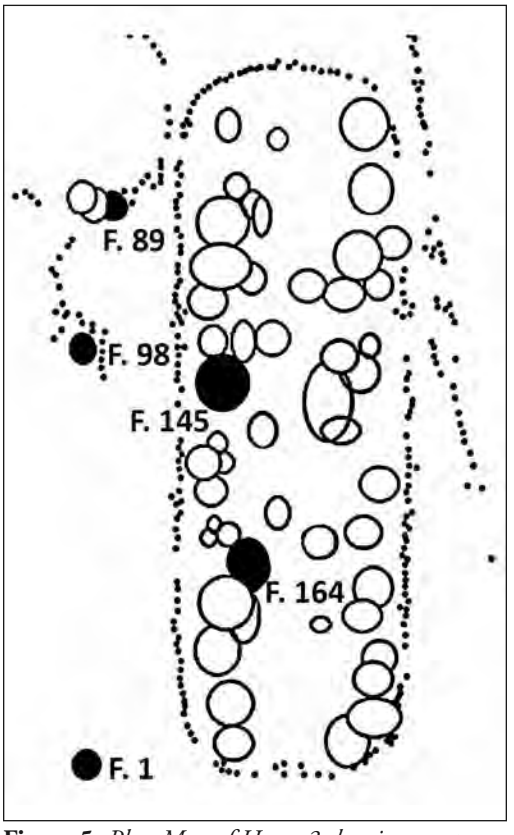

Figure 5. *Plan Map of House 3 showing mortuary features inside (F145, F164) and outside (F1, F89, F98).*

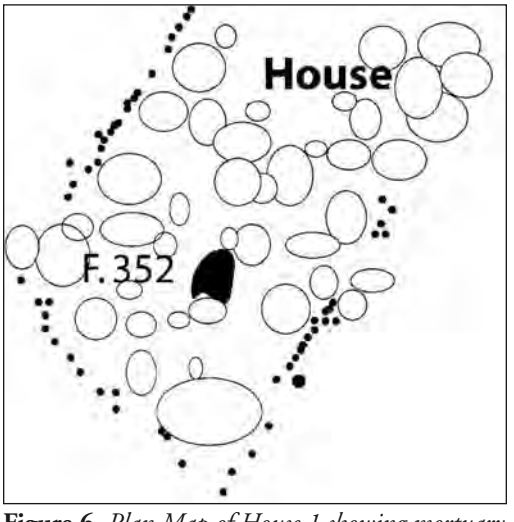

Figure 6. *Plan Map of House 1 showing mortuary feature F352.*

As noted above, the adult woman was represented by the cranium, mandible, both clavicles, the vertebral column from the ninth thoracic to the fifth lumbar, five incomplete ribs, both innominates, the sacrum, both femora, and the right tibia. The articulation of the spinal segment and of the left femur and innominate indicates that there had still been some soft tissue present when the body was being prepared for the secondary burial in F352. Soft tissue is also suggested by the presence of some transverse cutmarks on the posterior surface of the left clavicle. However, given the absence of cuts on the femora, right tibia, and right clavicle, and the lack of articulations among the other elements, it seems that decomposition in the primary burial must have been extensive.

Also of interest is the fact that all the ribs and long bones of both the child and the woman are missing at least one end. Specifically, both of the child's ribs are incomplete, and the humerus is missing both ends and part of the shaft; A's clavicles lack both ends; her right femur is missing the head, greater trochanter, and part of the distal epiphysis; her left femur is missing its distal end; and her tibia lacks the distal end and part of the proximal epiphysis. The four right ribs and one left rib of A, though still articulated with the vertebrae, had been broken off about 5 cm from their vertebral ends. The breaks at all these points are old, to judge by the discolouration of their surfaces. The missing parts were not in F352, and the condition of the bone in the feature was otherwise rather good. Presumably the breakage occurred during the original exhumations of the woman and child from their primary burials or during their preparation for the secondary burial.

There were grave offerings in F352, all associated with the skeletal remains of the woman. Her cranium and mandible rested on a large segment of antler. Also, a tool of mammal long bone, split lengthwise, was lying nestled within the arc of her mandible. It is 180 mm long by a maximum of 28 mm wide, tapering to 10 mm wide at one end (this end is broken off and the tip was not found). There are no indications of use, such as striations or polishing on the tool. A very similar but smaller implement with the Roffelsen burials shows considerable use wear (Spence et al. 2014: Figure 4).

Beneath the bone tool were two chunks of the same kind of stone, with numerous quartz inclusions, as was found in F164. Given their size and location, it is clear that they had been deliberately placed in F352. Also present were some small fragments of turtle shell and some charred maize kernels, but they may not have been deliberate inclusions in the feature. They came from a deeper point, the base of the pit, where there was also a deposit of grey ash and some fragments of burned non-human bone. The association of these with the burial is uncertain.

Comments

The three secondary burials all seem to have been associated with houses. F164 was in House 3, while F1 was only 3 m from a House 3 entry (Figure 5). Both features had paired posts on their margins. F352 was in House 1. This locational data suggests that the final burial event was more an affair of the house social unit than of the community as a whole.

Two of the secondary burials had grave offerings. F1 may have had one too, but it was not visible on the surface. Some of the grave offerings may actually have been materials and tools used in the rituals. The yellow clay, for example, may have provided pigment, although none was seen on the bones. Similar material was found in the Roffelsen burial. Also, tools of split long bone, perhaps used somehow in burial preparations, occurred in both F164 and at Roffelsen (Spence et al. 2014). Particularly striking are the very similar stones with abundant quartz inclusions that were found in both F164 and F352. The only other possible grave offerings in Bingo Village were some of the items in the mass of material associated with the two teenagers in the F590 sorted deposit: the four complete points, two stones of micaceous schist, pipes, and celt.

One important question is whether any individual was represented in more than one mortuary feature. One might expect people in the secondary burials to also be represented in sorted deposits. Each individual in the series was compared with each other individual in order to

assess this possibility. The comparisons considered age, sex, and skeletal element duplications. For example, F1B, F164E, and F352B are all children in the 6–9 year age span, and could conceivably be the same person, since none were complete. However, because the skeletal remains of each of the three included the right humerus, they must all be distinct individuals. This exercise was limited by the fact that so many of the individuals were represented by relatively few elements. Also, if we knew more about F1, we might have been able to increase the number of potential matches – or we might have found additional individuals to further complicate matters.

At the moment, we are concerned with the possibility that some people in the secondary burials might also be represented in the sorted deposits. Sex was not a factor at this point since no sex identifications were possible in the relevant sorted deposits. Comparisons based on age and element duplication (Table 6) established that individuals F1B, F164C–E, and F352B from the secondary burials were not represented in any of the sorted deposits. However, in several other cases the possibility of matches cannot be eliminated. This result does not mean that all, or any, of them are really matches. However, it would not be surprising to find, for example, that the two teenagers in sorted deposit F590 were the same people as F1A and F1C of secondary burial F1. The two features are only 6 m apart.

In the course of excavation and analysis an unexpected pattern was observed. Relatively complete vertebral columns and sets of ribs from the same individual did not appear together in any of the features, excepting the two undisturbed primary burials. Ribs and vertebrae had usually been parted and disposed of separately. In some cases, especially with infants and young children, this may have been accomplished easily enough. In a severely decomposed body, the ribs can be pulled from the soft tissues of the torso with little difficulty, while tenacious muscles and ligaments will continue to bind the spinal column. However, in some Bingo Village adults (F89, F196, F352A), the ribs had been deliberately snapped off near their vertebral ends. The separation of the ribs and vertebrae must have had some special significance.

In many cases, most of the ribs were left in the sorted deposit and so excluded from the secondary burial, while most of the vertebrae were selected for the secondary burial: F89, F234, F237, F387, F412. The mirror image of these cases can be seen in individuals in the secondary burials. F164C–G and F352A had vertebrae but few ribs (Tables 4–5). For example, perinatal infant F164G was represented by 38 unfused vertebral arch halves and 17 vertebral bodies but no ribs. In only one case, F196, were the vertebrae returned to the primary burial while the ribs were removed (Table 2). It appears, then, that the Bingo Village people were not concerned with ribs, but did attach some significance to the vertebral column, enough to forcefully separate the two at times.

Table 6. *Potential matches between secondary burials and sorted deposits.*

Secondary Burial Individual	Age	Sorted Deposit Potential Match(es)	Age(s)
F1A	13–15 yr	F590A, F590B	14–16 yr, 14–18 yr
F1C	11–14 yr	F590A, F590B	14–16 yr, 14–18 yr
F164A	30–45 yr	F232	adult
F164B	15–17 yr	F590A, F590B	14–16 yr, 14–18 yr
F164F	3–4 yr	F93, F387	1–3 yr, 3–4 yr
F164G	perinatal	F237	infant
F352A	34–61 yr	F232	Adult

Other Arkona Cluster Mortuary Features

Mortuary features were also encountered at three other Arkona cluster sites. Two of these (Figura and Location 9) were village sites. Note, however, that the faunal remains from these sites have not yet been thoroughly examined, so further analysis may yet reveal some unrecognized sorted deposits from them. As noted above, two of the sorted deposits from Bingo Village were not identified until human bones were found during analysis of the faunal material.

Figura Feature 302

F302 was in a Figura house (Spence 2013b). It was the "torso burial" of an adult male, consisting of the articulated pelvic girdle (lower vertebrae, sacrum, and both innominates), the hyoid elements, both patellae, small fragments of two ribs, and a cranial disk. A chert knife and projectile point were present, perhaps as an offering or as tools used in the exhumation and processing for secondary burial. There was a cutmark on one of the innominates.

Location 9 Feature 67

F67 was the secondary burial of an adult, probably female, in the Location 9 village (Spence et al. 2010). The burial had been damaged during topsoil removal, but there was evidence of an advanced treponemal infection in the surviving parts of the cranium. Cutmarks show an attempt to remove a cranial disk, abandoned when it became apparent that the infection had entered the bone there.

Location 10 Feature 5A

Location 10 was a small cluster of pits 115 m east of Bingo Village. One of these, Feature 5A, contained the secondary burial of an adult male. The skeleton had been badly damaged during topsoil removal and was poorly preserved. The elements present were the cranium, both femora, both tibiae, and one of the smaller long bones. No disk had been removed from the cranium, and no hole had been drilled in it. Given the absence of other village sites in the vicinity, this burial was probably an outlying feature of Bingo Village. The feature was removed intact for reburial without further examination.

Discussion

The External Affiliations of the Arkona Cluster

The Arkona sites are on the frontier between the Western Basin Tradition to the west and the Ontario Iroquoian Tradition to the east. Ceramic forms and decoration require more study before their affiliation can be identified. The Bingo Village longhouses may owe something to Glen Meyer influence, but could also be responses to local social concerns. Glen Meyer and Younge phase peoples may have been experiencing similar pressures and opportunities as they adjusted to the more settled and larger communities made possible by an increasing reliance on maize horticulture. The Bingo Village houses, although somewhat longer than those at Figura, were still not over 20 m in length. They may have been the residences of extended families with two or three nuclear families per house. In other Younge phase sites in southwestern Ontario, the extended family was the primary social and settlement unit (Murphy and Ferris 1990; Spence et al. 2014). In the Arkona area, the extended family may have retained its social integrity through joint residence within the larger community.

The information on the Arkona burials points to Western Basin affinity. Cranial disks and drilled holes are common in Western Basin burials but were not part of Ontario Iroquoian burial practices (Greenman 1937; Murphy and Ferris 1990; Speal 2006). Disk removal was accomplished in the Arkona sites in much the same way as in other Western Basin areas (Spence et al. 2014). A sharp-edged instrument was used to cut away the scalp and saw into the bone, and a broader-edge tool, such as a burin, was used to score it deeply. The final freeing of the disk from the cranium was usually accomplished by applying pressure to the disk, as shown by the irregular protrusions of the inner table from the edges of the disk.

There is some variation among the Arkona cluster burials. At Figura and Location 9, the disk removal was with adults (although it was not

completed in the Location 9 case). At Bingo Village, it occurred only with infants and young children, so there may have been some differences in the beliefs underlying the practice.

Another question about disk removal is whether it was done at the time of the primary burial or at the later time of exhumation and sorting for the secondary burial. It must have been part of the primary burial rituals at the Roffelsen site, where all the individuals were unexhumed primary burials. At Figura and Bingo Village, the cranial disks were found in what we believe were exhumed primary burial pits. However, the possibility that the disks were removed during processing for secondary burial cannot be eliminated with the available evidence.

These data also bear on another question. Some archaeologists believe that the disks were removed so that they could be kept as relics or objects that held sacred power (Murphy and Ferris 1990:270; Redmond 1982:24–25). However, at the Arkona sites, the disks were left behind with the other bones that were not retained for secondary burial. They seem to have been considered unimportant for the reburial.

Demographic Considerations

Four houses can be identified at Bingo Village, each with space for 2–3 nuclear families. Houses 1, 3, and 4 probably had three families each, while House 2 had space for two families. Overall, a total of about 11 nuclear families in the village as a whole is suggested (Figure 2). Using an Ontario Iroquoian estimate of 5 people per family (Warrick 2008:145), there would have been about 55 residents at Bingo Village at any one time. Applying a crude death rate of 30.6/1000/year, based on the Ontario Iroquoian Moatfield ossuary (Merrett 2003:177), 1.68 residents would be expected to die every year at Bingo Village. If 15 years of occupation is assumed, some 25 people would have died over the course of its existence. Divided by house, the deaths over 15 years would have included about 7 deaths from each of houses 1, 3, and 4, and about 4–5 deaths from House 2. These estimates are very rough, based on a number of assumptions: family size, mortality rate, number of families per house, and length of occupation. Most of these assumptions are conservative, so 25 deaths should be taken as a minimal estimate of village deaths.

Analysis indicates a total of 27 individuals in the mortuary features (Table 1). At first glance, then, it might seem that most or all of the village dead are represented. However, the actual Minimum Number of Individuals (MNI) is somewhat less than this. Eleven of the sixteen features are sorted deposits and lack most of the major elements. These individuals must also be represented in secondary burials within or outside the village. To obtain a better estimate of MNI we compared each individual with the others in terms of age, sex (where known), and element representation, as described above (Table 7).

If we take each individual in the site's mortuary features to be a distinct individual, without representation in any other feature, there is a site MNI of 27. However, as noted above, it is likely that some individuals are represented in more than one feature. When each individual is compared with every other individual in the site, a good number of potential matches cannot be excluded on the basis of age, sex, or element duplication (Table 7). There are only nine people who have no potential matches. However, it is impossible to say how many, and which, of the potential matches are valid. Certainly it cannot be all of them. Location 10 F5A can also be included in these calculations. Location 10 F5A and Bingo Village F196 and F164A are all adult males, and there are no element overlaps between F5A and either of the Bingo Village men, so F5A could be the same individual as either F164A or F196.

There is another complicating factor. Some of the individuals in the secondary burials were missing some major elements. This result might be expected with subadults. Their bones are smaller and more amorphous, so they may undergo a less rigorous sorting process. However, there are some puzzling absences even among the adults. F164A has no cranium or mandible, nor any of the leg long bones. The teenage F164B has no mandible and no long bones at all. F352A is missing all of her arm bones. It is possible that some individuals were divided during the sorting process, with some major elements diverted into

Table 7. *Potential matches among all individuals.*

Individual	Sex	Age	Potential Match(es)
F1A	–	13–15 yr	F590A, F590B
F1B	–	7–9 yr	none
F1C	–	11–14 yr	F164D, F590A, F590B
F89	–	adult	F145, F232
F93	–	1–3 yr	F164F
F98	–	13–16 yr	F590A, F590B
F145	female	44–74 yr	F89, F232
F164A	male	30–45 yr	F232
F164B	male	15–17 yr	F590A, F590B
F164C	–	11–12.5 yr	none
F164D	–	10–11 yr	F1C
F164E	–	7.5–8.5 yr	none
F164F	–	3–4 yr	F93, F387
F164G	–	perinatal	F237
F196	male	39–67 yr	none
F207	female	20–25 yr	none
F218	female	20–25 yr	none
F232	–	adult	F89, F145, F164A, F234, F352A
F234	female	34–61 yr	F232
F237	–	infant	F174G
F352A	female	34–61 yr	F232
F352B	–	6–7 yr	none
F387	–	3–4 yr	F164F
F412A	–	2 mo–1 yr	none
F412B	–	1 yr	none
F590A	–	14–16 yr	F1A, F1C, F98, F164B
F590B	–	14–18 yr	F1A, F1C, F98, F164B

other contexts. If so, those other contexts must be outside the village.

The age distribution is unusual. Putting aside the possibility of some individuals appearing in more than one feature, there are 4 infants (0–1 year), 3 young children (1–4 years), 5 older children (6–12 years), 6 teenagers (13–17 years), and 9 adults (20 + years). Eleven individuals are in the 6–17 years span, representing 41% of the total. This high proportion is unexpected. Members of this age category usually have very low mortality (Merrett 2003). They have survived the threats associated with infancy and early childhood (birth problems, congenital defects, weaning difficulties) and have not yet encountered the challenges of adulthood (pregnancy and childbirth, conflict). It is possible that there was some particular local threat to children and teenagers in the Arkona area, or that the high proportion in this age group is just a statistical

error resulting from the small sample size. More likely, though, it reflects an actual age bias in mortuary practices. People in this age category may have been sorted and reburied more often close to home, while adults were more frequently reburied farther away from the village (e.g., Spence 2011b). There are 8 subadults and 5 adults in the sorted deposits, and 10 subadults but only 2 adults in the secondary burials. This separate reburial of adults suggests that the village population and mortality estimates discussed above may indeed be too conservative.

F412 was outside the village palisade, but only by 3.5 m. It is thus treated here as one of the internal mortuary features of the village. The Archaeologix excavation extended some metres beyond the palisade and uncovered a number of features, but only F412 held human bones. Probably, then, the elements missing from the village mortuary features were buried farther away, for example, in F5A. It would be very difficult to locate these small and scattered features, especially without the presence of occupation debris on the surface to alert archaeologists to the feature's presence.

The Social Contexts of the Mortuary Features

Most of the mortuary features were in the plaza or in the smaller open area immediately to the east of it. Events there would have been public, open to the community as a whole. Those events would have included primary burials, their exhumation, and their sorting. Nevertheless, there is some evidence that the mortuary events were still primarily conducted by members of the relevant house social unit, with the wider community perhaps acting more as audience than as active participants. One cluster of three sorted deposits, most or all of which had probably also been the primary graves, was located in the northwest corner of the plaza, in close proximity to houses 1 and 2 (Figure 2). F89 may have been associated with House 2 and F387 with House 1. Other features, including all those with enclosures, were along the eastern side of the plaza and in the open area farther to the east, closest to House 3 and perhaps also including people from House 4, immediately to the east of House 3.

The association of secondary burials with houses is clear. F352 was inside House 1, F164 was inside House 3, and F1 was in the open area on the west side of House 3, near a House 3 entry (Figure 5). Both F1 and F164 had paired posts on their peripheries. Surface architecture with mortuary features, whether enclosures or paired posts, may have been a House 3 practice.

F207 and F218, the unexhumed primary burials of adult women, were in the plaza (Figure 2). These women may have been newcomers to the community, not yet fully absorbed into it, and perhaps even captives. Small-scale intercommunity conflict occurred in southwestern Ontario well before the time of Bingo Village (Spence and Wilson 2015). However, there was an enclosure with the woman in F207, suggesting that she may have had some association with House 3.

Conclusions

Bingo Village had far more mortuary features than the other Younge phase sites in the Arkona area. This abundance may in part reflect a slightly larger residential population and/or longer occupation, but it seems likely that there were also some underlying differences in practice. The nature of these differences is difficult to determine because there is so little information on burials from the other sites. However, the more numerous features at Bingo Village allow some insights into the pattern there. Most of the village's deceased were at some point exhumed from their primary burial places (F207 and F218 excepted) and reinterred collectively in secondary burials after some sorting. These secondary burials and most of the sorted deposits can be associated with houses, suggesting that each held members of the social unit residing in that house. The crude death rate and the size of the houses suggest that each house would have suffered the death of a resident once every couple of years. The secondary burials each include from two to seven individuals, so exhumation and reburial were probably not annual events. The actual length of the mortuary cycle may have varied with each house, responsive to the tempo of life and death in the social group that occupied that house.

The differences in mortuary practices in the Arkona area may have reflected shifting social concerns. Although we do not know how the other Arkona area communities organized their treatment of the dead, it seems that at Bingo Village residential groups were the major social actors. This focus, in turn, suggests that these social groups may have been formally defined and a principal locus of identity within the community. However, although the first events in the mortuary sequence, the primary burial and its subsequent exhumation and sorting, seem to have been conducted primarily by the house social unit, they usually took place in a central open area, the plaza and the area to the east of it, where the rest of the village could also gather and be involved in the events. In fact, they could hardly ignore them. The exhumation and sorting, in particular, would have involved multiple graves and bodies. In contrast, the final secondary burial was restricted more to the house group and occurred either in or very near the house, or beyond the village. This sequence of practice may have served to maintain the social primacy of the extended family house group while still acknowledging the emerging wider community, the village. Mortuary rituals became the vehicle to accommodate the wider intimacy and intensified interaction created by this new social environment. Creese (2016) describes a further transition in this trajectory among Ontario Iroquoians, the shift to a community-wide final mortuary event, the ossuary burial, that emphasized the shared identity of all the villagers, including newcomers.

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Le village Bingo (AgHk-42) est un site d'éléments de la Tradition Western Basin (phase Younge) dans le sud-ouest de l'Ontario, près de l'actuel village d'Arkona. Ce dernier représente un temps lors duquel les villages se formaient et que les familles élargies, qui étaient autrefois l'unité principale de peuplement, s'unissaient pour former des communautés plus grandes et plus établies. Les fouilles complètes du site palissadé du Village Bingo ont permis d'identifier 16 vestiges mortuaires, avec un total de 27 individus. Les vestiges peuvent être catégorisés en trois groupes : des sépultures de premier degré non exhumées, des vestiges classés et plusieurs sépultures de deuxième degré. Les vestiges classés sont des vestiges qui contiennent des éléments squelettiques exhumés provenant des sépultures de premier degré qui n'avaient pas été sélectionnées pour être incluses dans les sépultures successives de deuxième degré. Des preuves suggèrent que les événements de sépultures de premier degré, d'exhumation et de classement étaient menés par le groupe social occupant la maison longue du défunt. Par contre, ces événements avaient lieu dans des espaces ouverts, permettant ainsi la participation d'autres villageois dans les rituels. Les sépultures de deuxième degré étaient plus fortement liées au groupe résidentiel du défunt. Cette dichotomie d'inclusion était probablement un résultat des pressions créées par le nouvel environnement social de village et un premier pas vers l'accommodement de ce nouvel environnement. L'unité de famille élargie, nouvellement un groupe de longue maison, gardait toujours son intégrité lors des rituels, mais le bien-fondé social de la communauté élargie était aussi reconnu dans les étapes initiales de la séquence funéraire.

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From Grey to Print

The Blueberry Field Site (BcHa-23): A Middle Woodland Campsite in Wasaga Beach Provincial Park, Ontario[1]

David A. Spittal

The Blueberry Field site (BcHa-23) and several small associated artifact clusters, situated near the Nottawasaga River in the Town of Wasaga Beach, were salvage excavated in 1977. The recovered artifact assemblage includes portions of six ceramic vessels and small lithic and faunal samples. Two hearth features were also recorded. The site was a small, single component encampment of the Middle Woodland period. Located in an area where the dominant cultural associations appear to be with the Saugeen Culture to the west, the site also exhibits a strong affiliation with Point Peninsula sites to the east. The area of the lower Nottawasaga River appears to be an area where people of the two cultures came into close association.

Introduction

The Blueberry Field site was discovered by Philip Cooke of Wasaga Beach in 1973. A surface collection made at that time yielded a small number of ceramic sherds and one ground stone celt. Examination of the material by Thor Conway of the Parks Branch, Ontario Ministry of Natural Resources, determined that the site was a component of the Saugeen Culture. Subsequent surface collections by Roberta O'Brien, also of the Ontario Ministry of Natural Resources, yielded additional pottery, including decorated rim sherds and a small amount of lithic debitage. Survey of the general area by Philip Cooke, James Shropshire, Thor Conway, and Roberta O'Brien indicated that the Wasaga Beach area was extensively occupied by Middle Woodland peoples (see Conway 1973; O'Brien 1974). The site is located on property owned and managed by the Ontario Ministry of Natural Resources; the Wasaga Beach Snowmobile Club formerly maintained a clubhouse at the site. At the time of excavation, the area had been disturbed by tree clearing, the activities of the snowmobile club, subsequent demolition of their clubhouse, tree planting, wind erosion, and trail bikers who were active throughout the area of the sand dunes.

In 1977, a salvage excavation was undertaken by the Ontario Ministry of Culture and Recreation. The fieldwork was conducted by Roberta O'Brien, Regional Archaeologist, South Central Region, Historical Planning and Research

[1] The intent of the From Grey to Print section of Ontario Archaeology is to publish significant or influential studies/papers that are often cited but that, for whatever reason, were not previously published. The reports resulting from these studies are being presented here in their original form, without peer review. They have, however, been edited to conform to the journal's house style. This instalment of From Grey to Print was originally written in 1981.

Branch, with the assistance of the author. Additional field assistance was rendered by Philip Cooke, of Wasaga Beach, and Marie Taylor, then of the Historic Military and Naval Establishments, Penetanguishene. Field work was completed with the cooperation of the Ontario Ministry of Natural Resources and Wasaga Beach Provincial Park, under the conditions of the Ontario Heritage Act. Subsequent investigations were undertaken in 1979, when Roberta O'Brien, the author and a crew of Experience '79 students returned to the site and salvaged a small portion of adjacent roadway which was being destroyed by pipeline construction.

Environmental Setting

The site is located in Wasaga Beach at the southernmost end of Georgian Bay (Figure 1). The Nottawasaga River, which has a drainage area of 2,966 km^2, enters Nottawasaga Bay at this point. Its main branch, about 145 km long, flows from the southeast and drains much of the land west of Lake Simcoe.

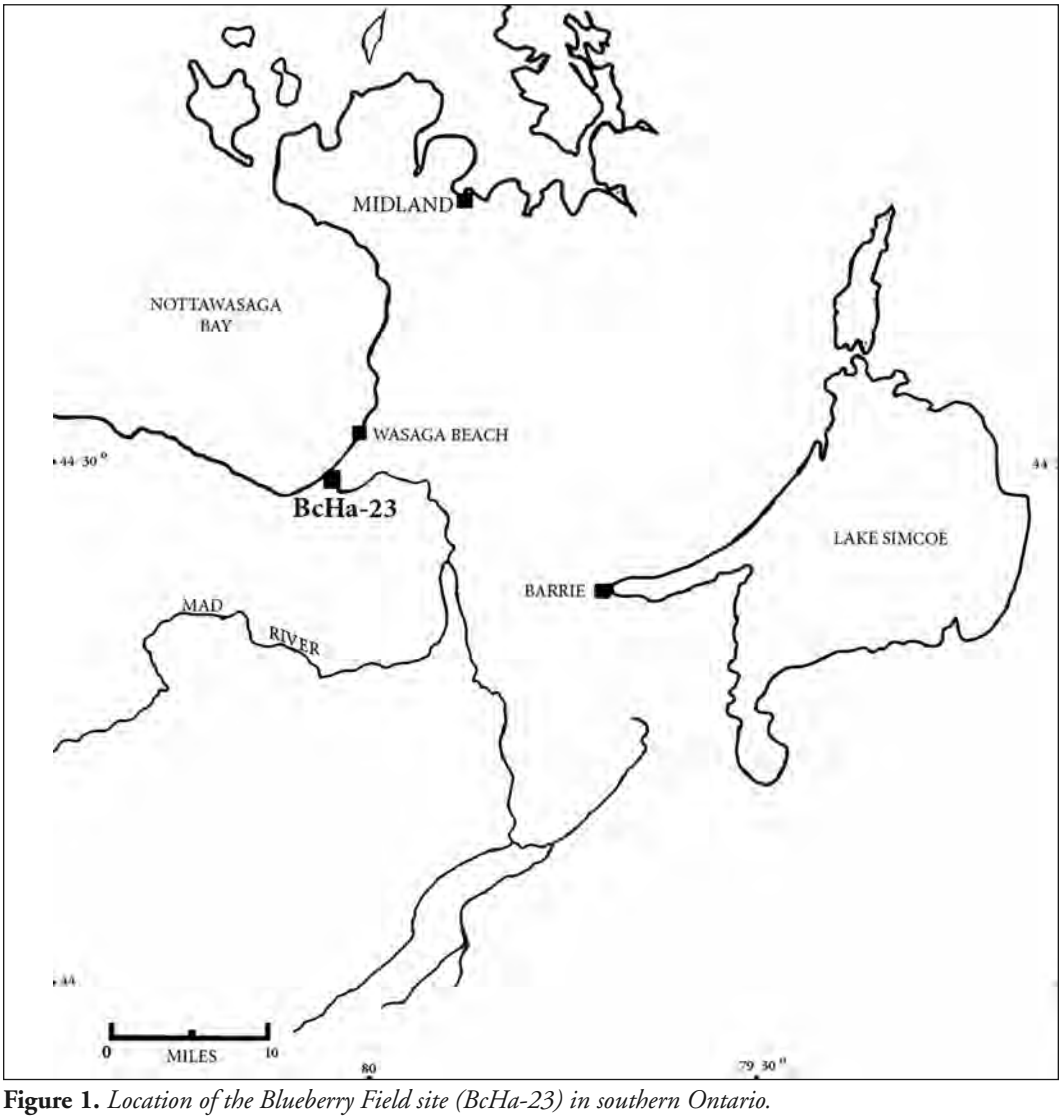

Figure 1. *Location of the Blueberry Field site (BcHa-23) in southern Ontario.*

The geomorphology of the site region is the result of recent post-glacial activity. After the retreat of the Wisconsin glacier at about 12,000 years RCYBP, the entire Wasaga Beach area was completely submerged by the waters of Glacial Lake Algonquin. Between 12,000 and 10,000 years RCYBP, the level of this lake dropped rapidly to a level lower than that of present Georgian Bay, stabilizing at several points to form gravel beaches and terraces. Following this low level was a period of gradual rising to the fossil Lake Nipissing level, between 8,000 and 4,000 years RCYBP. The present landscape was formed primarily during this high water level.

The modern landscape can best be understood as resulting from the effects of the forces of wind against a moderately fast flowing river. The Nottawasaga River enters the area through a deep gorge cut across the Edenvale Moraine to the south and meanders northwest through a low flatland. During the Nipissing Stage, the course of the river was impeded at its mouth by the formation of a complex of high parabolic sand dunes at the beach. This resulted in the formation of a lagoon between the sand dunes and the moraine to the south. At the time of excavation, this basin contained swamps, marsh, and several small lakes and was subject to seasonal flooding. The Nottawasaga River cut through the dunes over a series of small rapids and then turned eastward to flow behind and parallel to the modern beach, then finally entered Nottawasaga Bay. The mouth of the river had been forced east by the action of prevailing westerly winds and waves that continually blocked the channel. It is assumed that most of the present beach, which is in fact a spit between the river and the bay, was the result of gradual shifting of the river mouth since about 4,000 RCYBP.

The soils of the high dunes and old beaches, on which the site is situated, are well drained and sandy, while the area behind the dunes consists of imperfectly drained sandy loams, clay marls, and muck. Dominant plant species associated with the fore and high dune features include red oak, red and white pine, red maple, white birch, and

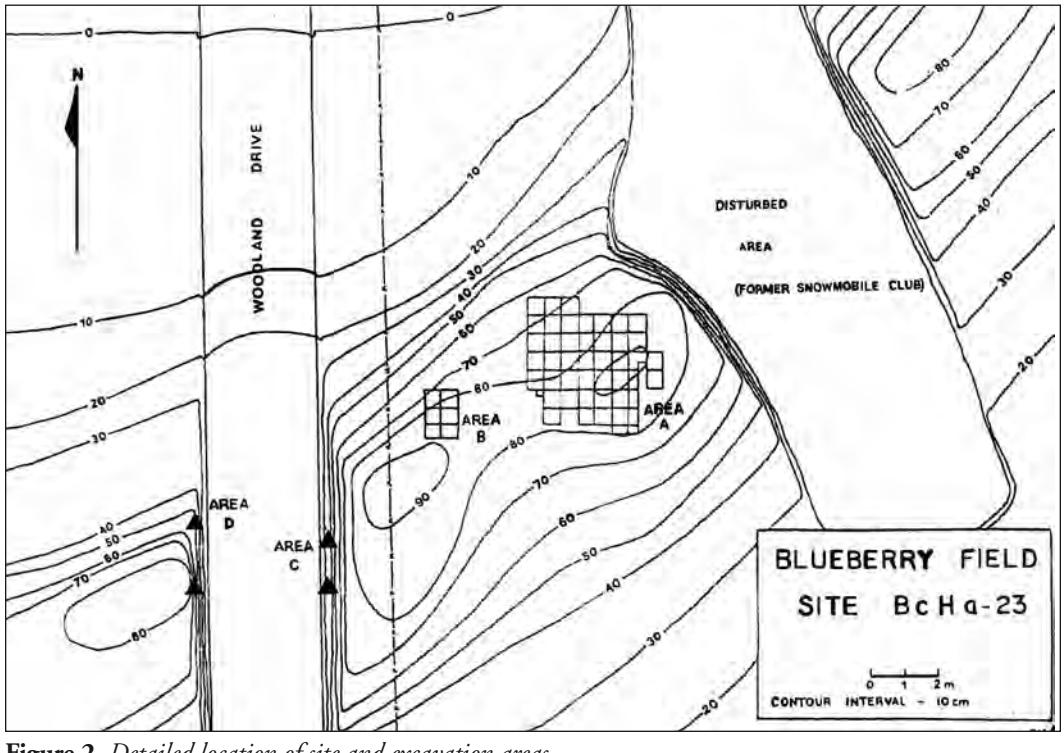

Figure 2. *Detailed location of site and excavation areas.*

hemlock. The area supports large numbers of fish and bird species, deer, bear, wolf, and a variety of small mammals.

Excavation

Excavations were conducted in four areas associated with the site. Figure 2 illustrates the four areas of investigation and the excavation plan of the site. The main area of excavation, Area A, is located on the crest of a small, stabilized beach ridge where surface collections had indicated a concentration of material. Random test pitting was initially employed to determine the general limits of the site. The actual limits of excavation were determined by artifact yield as each square was opened. A total of 43.5 square metres were opened in this area and excavated to subsoil.

The sod layer was first removed, and the underlying organic layer was excavated as one layer. Excavation continued a few centimetres into the sandy subsoil layer and was undertaken with shovel and trowel, with all backdirt screened through one-quarter inch [6.4 mm] screens. The unit of excavation was 50 × 50 cm subsquares within each 1 × 1 m square. All artifacts were plotted and bagged according to subsquare provenience.

A discrete concentration of pottery on the surface of the beach ridge 5 m to the south west of Area A was designated Area B. Six 1 × 1 m squares were opened in this area. This second locale probably represented a separate small component.

A third concentration of material, Area C, was recorded eroding out of the roadside about 5 m west on the same sand ridge and along the embankment of adjacent Woodland Drive. This small area was surface collected and salvage excavated by shovel and screen in 1979 during a subsequent visit to the area.

A surface concentration of pottery was recorded in 1977 on the west side of Woodland Drive, approximately 22 m southwest of Area A on the same sand ridge. Several small test pits were excavated by trowel in this area and the material eroding out of the roadside was removed at that time. This locale was designated Area D. It later came to the attention of Roberta O'Brien that a pipeline was to be laid along the west side of Woodland Drive by the Municipality of Wasaga Beach, and in 1979 an emergency salvage excavation of the area to be disturbed was undertaken. Approximately 1 m of the embankment was excavated by shovel and screen, and a small sample of pottery was recovered.

Area A

Stratigraphy and Features

The typical soil profile recorded in this area consisted of a surface layer of light grey-brown humus and sod, varying from 2 to 10 cm in depth, overlaying a dark brown to black organic layer with an average thickness of 5 to 7 cm. Below this was the subsoil base of clean, yellow sand. Due to disturbances at the site and its windswept condition, there was a thin layer of windblown sand across much of the site, and in some places the sod and organic layers had been removed. Only a few small stones and rocks were encountered.

This area appeared to be single component with *in situ* artifacts recovered from the uppermost levels of sandy subsoil; a summary of those artifacts can be found in Table 1. In some places, the upper few centimetres of the subsoil appeared compacted and slightly organic. This may have represented the remnants of a living floor or surface. Figure 3 illustrates examples of "typical" soil profiles encountered on the site.

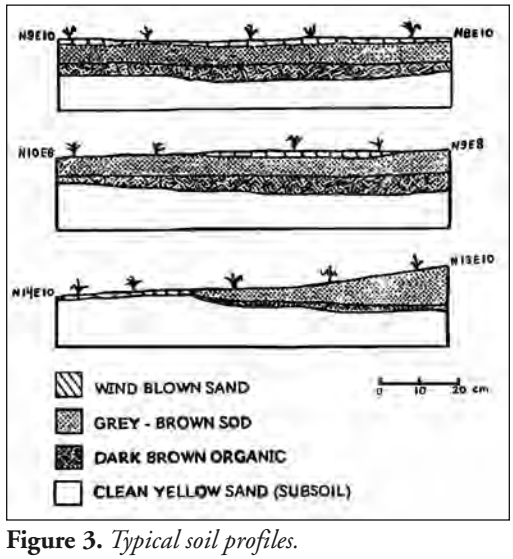

Figure 3. *Typical soil profiles.*

Table 1. *Summary of artifacts recovered from the Blueberry Field site (BcHa-23).*

Area/Artifact category	n
AREA A CERAMICS	
Vessel 1	69
Vessel 2	47
Vessel 3	48
Vessel 4	46
Vessel 5	24
Vessel 6	2
Unassociated body sherds	208
Basal sherds	12
Sherdlets, crumbs, etc.	1450
AREA A LITHICS	
Chert flakes	122
Quartz flakes	32
Quartz cores	3
Quartzite	1
Non-siliceous flakes	14
Utilized flakes	2
Scrapers	13
Drill?	1
Graver	1
Pièces esquillées	2
Bifacial tool fragments	3
Ground stone	1
AREA A NATIVE COPPER	
Round bead	1
AREA A FAUNAL REMAINS	
Various	100
Total	2202
AREA B CERAMICS	
Vessel 1	70
AREA B LITHICS	
Chert scraper	1
Total	71
AREA C CERAMICS	
Vessel 1	75
Vessel 2	1
Vessel 3	40
AREA C LITHICS	
Chert fragments	1
Total	117
AREA D CERAMICS	
Vessel 1	214
Total	214

Two hearth features were documented, both identified as hearth floors on the basis of a pale, orange–red discolouration of the subsoil sand. This reddish stain was confined to a very thin lens with indistinct borders; however, both of the features appeared more or less oval in outline. Feature 1 was 50 × 100 cm in size; Feature 2 measured 50 × 75 cm. Feature 1 contained a significant amount of burned bone, and Feature 2 yielded most of the quartz flakes and stone scrapers recovered from the site.

Ceramics

Pottery fragments constituted the largest single artifact class recovered from the site. Figures 4 and 5 illustrate their distribution. A total of 1,900 ceramic sherds were found, representing a

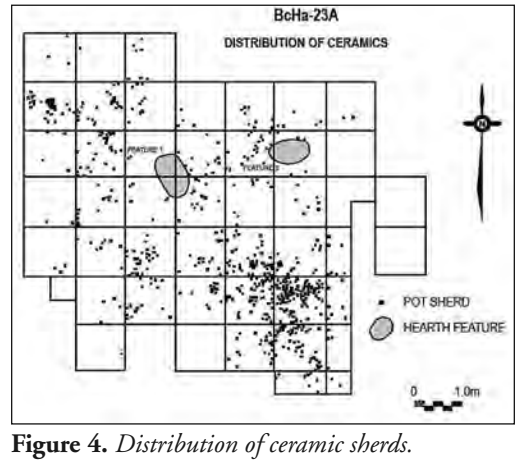

Figure 4. *Distribution of ceramic sherds.*

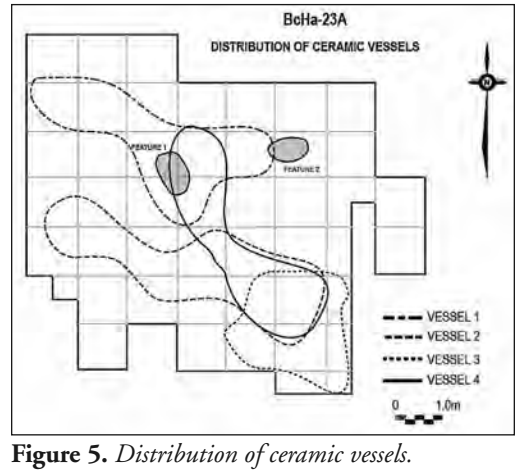

Figure 5. *Distribution of ceramic vessels.*

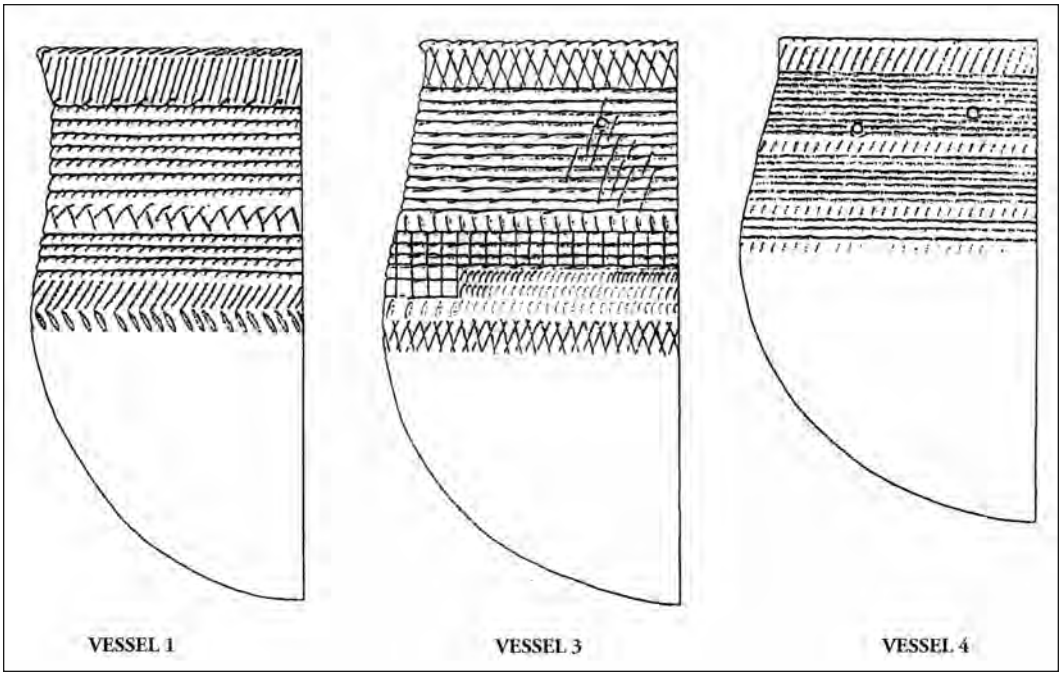

Figure 6. *Three reconstructed vessels illustrating design sequences.*

minimum of six vessels. Illustrated examples of three reconstructed vessels are provided in Figure 6. The majority of the sherds (1,450 of 1,990) are very small, exfoliated, disintegrated, or otherwise destroyed fragments that were not analyzed and will not be discussed further.

Four of the six vessels were represented by major portions of the rim and upper body. The other two vessels were identified by small numbers of rim or decorated body fragments. Summaries of vessel forms and manufacturing attributes are available in Tables 2 and 3. Each of the six vessels is described in detail below.

Vessel 1. This vessel is represented by 69 sherds. A large portion of the vessel has been reconstructed, allowing for an examination of the entire design sequence on the pot.

The rim of the vessel is outflaring, with a flat lip. The neck is slightly constricted, with a weakly developed shoulder. The basic vessel shape is globular. Temper consists of crushed fragments of

Table 3. *Ceramic vessel attributes of manufacture summary.*

Manufacturing attribute	Vessel 1	Vessel 2
Distribution of temper	Even	Even
Amount of temper	Moderate	Fairly large
Size of temper	1–4 mm Mean=2 mm	1–5 mm Mean=2 mm
Exposure of temper	Slight on both surfaces	Moderate on both surfaces
Texture of paste	Well knit	Moderately well knit
Texture of surfaces	Smooth surfaces	Interior not smoothed
Treatment of design	Neatly applied	Applied with coarse tool, fairly neatly applied
Treatment of body	Plain	Plain

Table 2. *Ceramic vessel forms summary.*

Form attribute	Vessel 1	Vessel 2	Vessel 3	Vessel 4	Vessel 5
Rim shape	Outflaring	Outflaring	Everted	Slightly outflaring	Slightly everted
Thickness of rim	7 mm	10 mm	8 mm	5 mm	6 mm
Thickness of lip	4 mm	5 mm	3 mm	4 mm	5 mm
Neck form	Slightly constricted	Slightly constricted	Almost straight	Slightly constricted	–
Thickness of neck	8 mm	10 mm	8 mm	7 mm	–
Shoulder form	Weakly developed	Very weakly developed	Very weakly developed	Weakly developed	–
Thickness at shoulder	9 mm	10 mm	9 mm	6 mm	–
Thickness of body	7 mm	9 mm	9 mm	5 mm	–

feldspar, evenly distributed throughout the clay in moderate amounts. Particle size ranges from 1 to 4 mm. A few fragments of the temper are exposed on the interior surface of the vessel. The paste of the clay is well knit. Coil breaks are evident on the rim and body portions of the pot; each coil overlapped the coil below on the interior surface.

The interior rim is undecorated. Lip decoration consists of regularly spaced right obliques executed with a dentate stamp tool. Exterior rim decoration consists of one horizontal band of evenly spaced right dentate stamped obliques, applied with a fine dentate tool. Below these is a series of seven horizontal lines that encircle the pot. These lines are parallel and continuous and were applied with a tool which was short and broad and had very fine, comb-like teeth. This dentate tool had been stamped obliquely and pulled to the right in a careful manner to produce the horizontal lines. Short, shallow punctates had been applied at regular intervals around the vessel at the juncture of the first oblique band and the horizontal lines. Below the series of seven horizontal lines is a horizontal band of dentate stamped impressions, which resemble inverted Ys formed by right obliques opposed by shorter left obliques. These impressions are regularly spaced and continuous around the vessel. Below this band is a second series of four horizontal lines, which are parallel and continuous. They were applied in the same manner and with the same tool as the first series of horizontal lines above. Below these lines is a horizontal band of left dentate stamped obliques above another horizontal band of rather deep, dentate stamped left obliques. Below those, the body of the vessel is plain.

Vessel 3	Vessel 4	Vessel 5	Vessel 6
Even	Even	Even	–
Moderate	Small	Fairly large	–
1–5 mm Mean=3 mm	1–3 mm Mean=2 mm	1–5 mm Mean=3 mm	–
Slight on both surfaces	Slight on both surfaces	Slight on both surfaces	Exposed on both surfaces
Moderately well knit	Well knit	Not well knit, crumbly	–
Smooth surfaces	Smooth surfaces	Rough, unsmoothed	–
Weak but fairly neatly applied	Neatly applied	Fairly neatly applied	–
Plain	Plain	Plain	–

All of the design elements were applied with a dentate stamp fairly large in size, but in a careful and controlled manner. The sequences of designs were executed from left to right.

The surface texture of the vessel is quite smooth. Faint striations can be seen in a few places on the interior of the pot. Surface treatment of the exterior is slightly more refined. There is slight evidence that the upper rim and body had been smoothed following application of the design. The body below the shoulder is well smoothed and plain. Many of the sherds show a slight polish on their exterior surfaces, and it may be that the vessel had been given a pale red ochre wash. The vessel was constructed by the coiling technique, with subsequent finishing with a paddle and anvil. All vessel surfaces are smooth and regular.

Vessel 2. This vessel is represented by 47 rim and upper body fragments. The rim of the vessel is outflaring, with a flat lip. The neck and shoulder are both weakly developed, and the vessel shape could not be determined. Temper consists of crushed fragments of quartz, feldspar, and granite that are evenly distributed in fairly large amounts throughout the clay. Particle size averages 2 mm, with a range from 1 to 5 mm. Fragments appear on both interior and exterior surfaces. The paste of the vessel is only moderately well knit. Coil breaks and the cross-sections of sherds show the vessel had been constructed by the coiling technique. Adjacent coils are both evenly and unevenly overlapping. The interior surface of the vessel is rough in texture but fairly regular.

Interior rim decoration consists of one horizontal band of left dentate stamped obliques applied directly below the lip. The impressions are evenly spaced and were executed with a coarse tool. Lip decoration consists of evenly spaced right obliques, which had also been applied with a dentate tool.

The uppermost exterior decoration consists of a horizontal band of evenly spaced criss-crosses applied with a pseudo–scallop shell stamp. Below this band of criss-crosses is a series of at least 10 horizontal lines that encircle the vessel. These lines are parallel and more or less continuous and were applied with a dentate stamp. Below these lines is another horizontal band of pseudo–scallop shell criss-crosses, evenly spaced around the pot, followed by another series of five horizontal lines executed with a pseudo–scallop shell stamp. Below this series of lines is another band of pseudo–scallop shell stamped criss-crosses, and, finally, there is a horizontal band of pseudo–scallop shell stamped right obliques. The body is plain below the shoulder of the vessel.

It appears this vessel had been slightly smoothed following application of the design elements. The undecorated body of the pot is also smoothed. Surface texture is smooth, with fairly regular, even surfaces. The design elements had been carefully and neatly applied throughout.

Vessel 3. This vessel is represented by 48 rim and upper body fragments. The rim is everted, with thinning towards the lip. The neck and shoulder are not well developed, and the vessel shape appears rounded. Temper consists of crushed fragments of feldspar and granite that are evenly distributed throughout the clay in moderate amounts. A few fragments appear on the interior surface. Average particle size is 3 mm. The paste of the clay is moderately well knit, with coils evident in sherd cross-sections and at coil breaks. The coils are evenly overlapping on exterior and interior surfaces. The interior rim is decorated with one horizontal band of obliques impressed with a dentate tool. The lip is decorated with similar right oblique impressions at regular intervals.

This vessel has the most complex exterior vessel design sequence. Exterior rim decoration consists of one horizontal band of pseudo–scallop shell stamped criss-crosses. The impressions were weakly applied and somewhat indistinct. Below these criss-crosses is a series of 11 horizontal lines also applied with a pseudo–scallop shell stamp. The lines are parallel and more or less continuous. Below these lines is a horizontal band of short, vertical or slightly oblique pseudo–scallop shell stamped impressions that encircle the vessel. Below this narrow band is a series of three or four rows of horizontal, pseudo–scallop shell lines crossed at regular intervals by vertical lines, which produced a more or less regular grid-like design. This design element extends down the body of the

vessel, farther at one point of the shoulder than at other areas. Below this crossed line element are one to three horizontal bands of short, right dentate stamped obliques. Below this is a horizontal band of criss-crossed pseudo–scallop shell obliques that extend the sequence of exterior decoration. The vessel is plain below the shoulder.

In addition to the more or less regularly applied design elements, this vessel exhibits several oblique pseudo–scallop shell stamped impressions superimposed over the first series of horizontal lines. The decoration is reasonably carefully applied in all cases. The exterior surface of the vessel had been smoothed. The interior surface is less carefully smoothed; even so, the surfaces are fairly regular. Some horizontal striations are evident on the interior surface of the vessel.

Vessel 4. This vessel is represented by 46 rim and upper body sherds. The rim of the vessel is slightly outflaring, with a flat lip. The neck and shoulder are weakly developed, and vessel shape is difficult to determine since the lower portions of the body are absent, although a rounded shape is suggested.

Temper consists of crushed fragments of feldspar evenly distributed throughout the clay in small amounts. Average particle size is 2 mm. Only a few fragments are exposed on the interior or exterior vessel surfaces. The paste of the vessel is well knit, with a few coil breaks visible. Vessel surfaces at the area of coil breaks indicate an even overlap of adjacent coils.

The interior of the vessel is undecorated. The lip has shallow vertical impressions which had been applied at uneven intervals along the lip, after which the lip had been smoothed. Exterior rim decoration consists of one horizontal band of right, pseudo–scallop shell stamped obliques, evenly spaced and applied directly under the lip. Below this band of obliques is a series of 10 roughly parallel lines which encircled the vessel. These lines are continuous, except for slight irregularities where the tool had been lifted and shifted to the right to make the next stamped impression. Below these lines is a second horizontal band of evenly spaced, short, right, pseudo–scallop shell stamped obliques. Below is another series of seven horizontal lines that had been applied with a pseudo–scallop shell stamp in the same manner as the first series. Below this is another band of short, right obliques, followed by another series of three horizontal lines, followed by one last horizontal band of short, right obliques. The tool of application for all the above elements was a pseudo–scallop shell stamp with indistinct tooth impressions resulting from secondary smoothing of the vessel exterior. The tool, in all cases, had been impressed from left to right in a careful, neat manner.

The body below the shoulder is plain. The exterior of the vessel is smoothed and has regular, even surfaces with a smooth texture. Interior surfaces are also smooth and regular but bear faint striations or wiping marks in some places.

Vessel 5. This vessel is represented by 24 decorated sherds and one decorated rim fragment. Temper consists of crushed feldspar evenly distributed in the clay in fairly 1arge amounts. Many fragments are visible on both exterior and interior surfaces. The average size of the particles is 3 mm. The paste of the vessel is not very well knit; most of the sherds appear crumbly. Sherd cross sections and the pattern of breakage suggests coiling was the method of manufacture. Coils appear to have been flattened and made to overlap their neighbours in a "shingling" effect.

The single rim sherd is small but appears slightly everted in profile. The lip is flat. Interior rim decoration is confined to one horizontal band of right obliques that was executed with a square dentate stamp. Lip decoration consists of right obliques also made with a dentate stamp.

Exterior rim decoration consists of one horizontal band of right, dentate stamped obliques impressed into the clay to form a pseudo–scallop shell design or effect. Fifteen of the remaining sherds exhibit parallel, continuous horizontal lines executed with a toothed tool vertically impressed into the clay to form a pseudo–scallop shell design. There are a minimum of five such lines. Below this is a horizontal band of left, pseudo–scallop shell stamped obliques, below which is a horizontal band of closely spaced, short, right, dentate stamped obliques, impressed into the clay and then dragged to the right. Below this, the body of the vessel is plain.

Vessel 6. This vessel is represented by two very small rim sherds. Temper consists of crushed feldspar and appears on both surfaces. Interior rim decoration consists of left obliques in a horizontal band. The application tool is difficult to identify since the impressions are indistinct, but a weakly notched, toothed tool seems likely. Lip decorations consist of an encircling line executed in dentate stamp. Exterior decoration consists of left, dentate stamped obliques. The exterior edge of the lip has a scalloped border.

Table 4. *Ceramic vessel decorative motifs and techniques summary*

Area/attribute of decoration	Vessel 1	Vessel 2
Interior		
Motif		Left obliques
Technique	Plain	Dentate stamp
Height of band		8 mm
Lip		
Motif	Right obliques	Right obliques
Technique	Dentate stamp	Dentate stamp
Exterior		
1st Decorative band motif	Right obliques	Criss-crosses
Technique	Dentate stamp	Pseudo–scallop shell
Height of band	19 mm	13 mm
2nd Decorative band motif	7 Horizontal lines	10+ Horizontal lines
Technique	Dentate stamp	Pseudo–scallop shell
Height of band	39 mm	43 mm
3rd Decorative band motif	Opposed obliques	Criss-crosses
Technique	Dentate stamp	Pseudo–scallop shell
Height of band	10 mm	13 mm
4th Decorative band motif	4 Horizontal lines	5 Horizontal lines
Technique	Dentate stamp	Pseudo–scallop shell
Height of band	20 mm	19 mm
5th Decorative band motif	Right obliques	Criss-crosses
Technique	Dentate stamp	Pseudo–scallop shell
Height of band	11 mm	12 mm
6th Decorative band motif	Left obliques	Right obliques
Technique	Dentate stamp	Pseudo–scallop shell
Height of band	8 mm	8 mm
7th Decorative band motif		
Technique		
Height of band		
Total height of exterior decoration	107 mm	107 mm

Miscellaneous Sherds. In addition to the ceramic fragments that were sorted into particular vessels, 208 sherds with both surfaces intact remained unassociated. All of these are undecorated body fragments.

Their exterior surfaces are generally regular and smoothed. Wiping marks or striae appear on a few examples, and these, too, had been smoothed over. Some of the sherds show evidence of paddling as a surface finishing technique or final shaping operation. One body fragment displays distinct impressions of a thonged or

Vessel 3	**Vessel 4**	**Vessel 5**
Verticals		Right obliques
Dentate stamp	Plain	Dentate stamp
10 mm		10 mm
Right obliques	Verticals	Right obliques
Dentate stamp	? Smoothed	Dentate stamp
Criss-crosses	Right obliques	Right obliques
Pseudo–scallop shell	Pseudo–scallop shell	Pseudo–scallop shell
14 mm	10 mm	12 mm+
11 Horizontal lines	10 Horizontal lines	Indeterminate
Pseudo–scallop shell	Pseudo–scallop shell	Indeterminate
43 mm	25 mm	Indeterminate
Verticals	Right obliques	Indeterminate
Pseudo–scallop shell	Pseudo–scallop shell	Indeterminate
8 mm	6 mm	Indeterminate
4 Horizontal lines crossed by verticals	7 Horizontal lines	Horizontal lines
Pseudo–scallop shell	Pseudo–scallop shell	Pseudo–scallop shell
20 mm	16 mm	8 mm+
3 Rows right obliques	Right obliques	Left obliques
Dentate stamp	Pseudo–scallop shell	Pseudo–scallop shell
20 mm	6 mm	13 mm
Criss-crosses	3 Horizontal lines	Right obliques
Pseudo–scallop shell	Pseudo–scallop shell	Dragged dentate
11 mm	9 mm	7 mm
	Right obliques	
	Pseudo–scallop shell	
	5 mm	
116 mm	77 mm	40 mm

grooved paddle that have subsequently been smoothed.

Interior surfaces are less well finished than exterior surfaces; there are more examples of striae or wiped marks and finger impressions. Surfaces tend to be less well smoothed, and many sherds exhibit irregular surfaces. Maximum thickness was measured on 100 sherds, yielding a range of 5 to 10 mm, averaging 7 mm, which indicates fairly thin-walled pottery.

The favourite method of vessel construction evident from these sherds is coiling followed by paddle-and-anvil finishing. Coil breaks are abundant on all vessel sherds and tend to be larger on sherds from the lower portions of vessels. The paste of the sherds is generally well knit, with a few crumbly examples. Overlapping of joints between adjacent coils is seen in many examples. The usual form of overlap is even in most cases, but exterior and interior overlap also occurs. Another method of joining coils consists of flattening adjacent coils and overlapping them in a shingling manner.

There are 12 basal sherds that, when reconstructed, are from two vessels with conoidally shaped bases. Maximum thickness of these sherds is 12 mm. The small number of sherds identified as bases may suggest that at least some of the vessels were round bottomed or globular.

Ceramic Summary. The site is small and temporary campsite with a correspondingly small ceramic assemblage. Of 1,450 sherds, six vessels were identified, and four of these were reconstructed, which allowed for examination of the entire sequence of exterior decoration. One other vessel was partially reconstructed to show at least some of the design sequence.

The assemblage is characterized by coiled vessels with relatively thin, fairly well knit walls; slightly constricted necks; and outflaring or everted rims. Table 4 summarizes the decorative techniques and motifs for each of the five mended vessels. The lips are flat in all cases and bear dentate stamped impressions. Interior decoration is absent in two cases and confined in the others to one band of dentate stamped obliques directly below the lip.

For exterior decoration, the preferred tool of application was toothed, resulting in either dentate or pseudo–scallop shell stamping. A decorating tool notched alternately on two edges of the same side and stamped vertically into the clay yielded a design showing a "continuous meander" and was classified as pseudo–scallop shell. Another tool that had been notched in the same way on only one edge and used to provide an oblique impression without a meander was classified as dentate stamp. It is obvious that similar tools applied at different angles would have resulted in different motifs and that angle of application is a critical variable when differentiating the two techniques. Depth of application and subsequent surface finishing techniques also play a role in obscuring decorative elements and may have affected the classification of tool type. None of the vessels exhibit a motif where square, round, or rectangular tooth or notch impressions were discrete from one another. The notched tools were generally fine, and the resulting tooth impressions are usually closely spaced; there was some difficulty differentiating between dentate and pseudo–scallop shell impressions. Dentate stamp was identified in those cases where the tool had been applied obliquely into the clay, giving clear evidence of a tool with notching on one edge only, or where the tool had been applied obliquely and only one edge of the tool was used to make the design. Evidence of a "continuous meander" was considered the result of notching on both edges of the tool; this was identified as pseudo–scallop shell stamp. Plasticine impressions were used to differentiate between the two techniques in some cases. The tool of choice was predominately pseudo–scallop shell stamp, with some examples of dentate stamp.

The motifs of exterior decoration are complex, consisting of a series of decorative elements applied in horizontal bands around the vessel. Exterior decoration extends downward from immediately below the lip and consists of up to seven encircling bands of stamped impressions extending to the shoulder of each vessel, which are weakly developed. Vessel bodies below the shoulder are plain.

Exterior decoration commonly consists of alternating bands of oblique and horizontal design elements; each vessel is decorated with oblique elements directly below the lip, which are followed by a series of horizontal lines, followed by a second series of oblique elements, followed by a second series of horizontal lines, followed by two bands of oblique elements, at which point the decorated part of the vessel ends at the shoulder. Extra design elements include punctates on Vessel 1, a few superimposed obliques on Vessel 3, and superimposed verticals on Vessel 3. Vessel 3 has a series of verticals in its third decorative band, and Vessel 4 ends with a third series of horizontals and one band of obliques.

With minor variability, there is a common pattern of vessel decoration. The site is a small one and was most likely occupied by a small number of persons, probably a nuclear family. Whether the vessels were made by one individual or several closely related people, the ceramics exhibit a readily observable example of patterned behaviour. It is tempting to view the pottery as a "decorative type" which would have expressed family or kin identity. Since samples from nearby components were small or consisted of unassociated fragments only, it was not possible to determine if they yielded vessels with comparable design sequences. The relationships between this pottery assemblage and those from other sites remain unknown. Vessel 1 from the Stockin site (BfHa-4) at

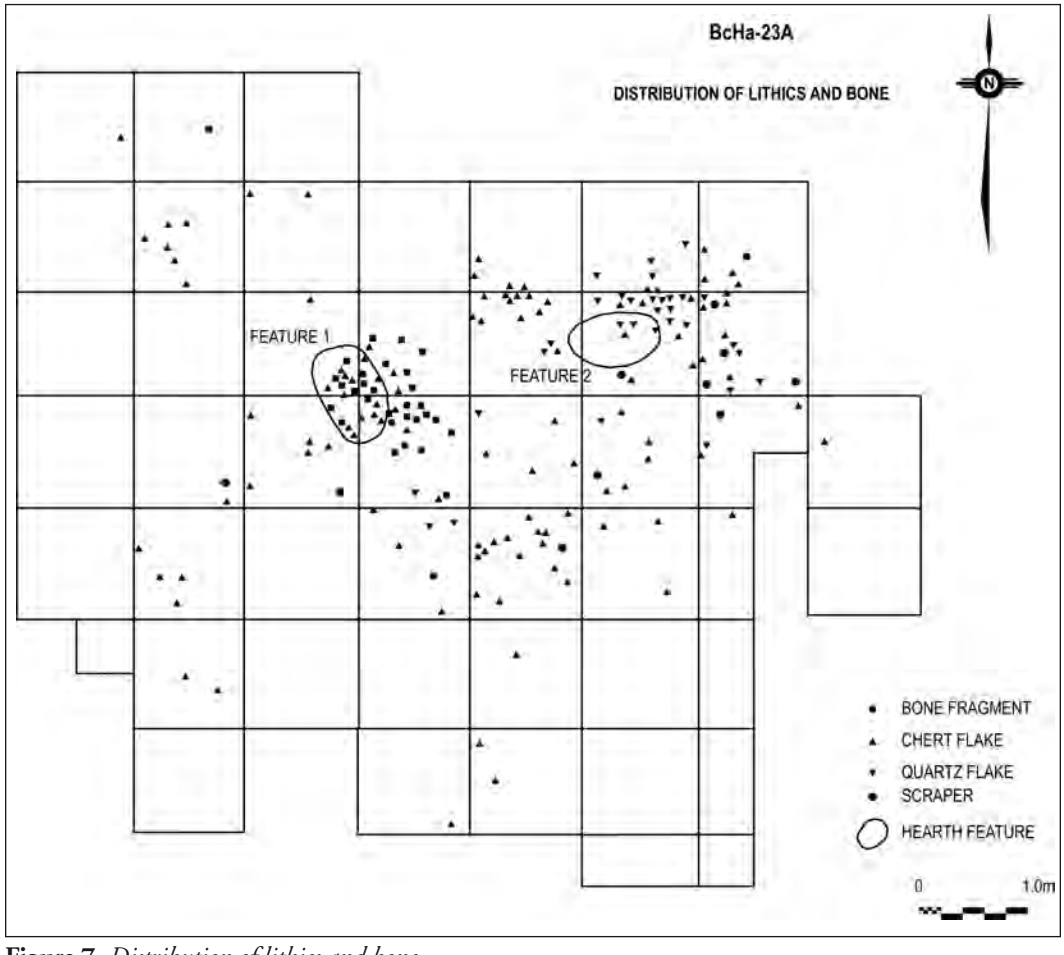

Figure 7. *Distribution of lithics and bone.*

Methodist Point (O'Brien 1976:64) exhibits a similar pattern of alternating bands of obliques and horizontals (with superimposed punctates), and at least one vessel from the Burley site (AhHi-2) (Jury and Jury 1951) shows the same pattern. Obliques over horizontals on upper rim is not an uncommon motif on either Saugeen or Point Peninsula sites, but reconstructed vessels are generally not available to determine the entire sequence of exterior decoration or the exact relationship between these two types of motifs.

Lithics

The lithic sample was recovered from across the site (Figure 7). A small number of flakes and one ground stone celt were collected during surface examination of the site in 1973 and 1974, with the bulk of the material excavated in 1977. The lithic sample is characterized by poor-quality cherts and some quartz, with very few finished or complete tools.

Raw Materials. Chert, quartz, quartzite, and non-siliceous rock fragments were recovered (Table 5). The bulk of the material consists of items of poor-quality cherts of various grades and colours. The most common is a grey chert of a fairly wide colour range, generally light, that was identified as Gull River chert. Some of the fragments have cortex adhering to one or more of their surfaces, indicating a pebble origin; Gull River chert was available in pebble form from the local till deposits. A white to yellow–white chert was also found that was identified as Collingwood chert. It

Table 5. *Lithic raw materials summary.*

Raw material	Debitage	Tools	Total	%
Gull River chert (grey cherts)	57	7	64	33.0
Collingwood chert	45	1	46	25.0
Kettle Point chert	2	2	4	2.0
Translucent white quartz (chalcedony)	4		4	2.0
Chalky white chert	16	2	18	9.0
Unidentified chert		6	6	3.0
Quartz	32	3	35	18.0
Quartzite	1		1	0.5
Non-siliceous material	14	1	15	8.0
Total	171	22	193	99.5

Table 6. *Lithic flakes summary.*

	Chert		Quartz		Quartzite	
Flake type	**N**	**%**	**N**	**%**	**N**	**%**
Shatter fragments	59	48	20	57		
Flakes	11	9	4	11		
Flake fragments	35	29	8	23		
Small retouch flakes	12	10				
Bifacial lipped flakes	1	0.1			1	100
Pebbles and fragments	4	3				
Cores			3	9		
Total	122	99.1	35	100	1	100

was quarried in the Niagara Escarpment to the west of Wasaga Beach. Two flake and two tool fragments of Kettle Point chert from Port Franks on the Lake Huron shore were also identified. In addition, there are four flakes of a translucent, good-quality material, probably chalcedony, and several fragments of an unidentified, chalky, white chert.

In addition to chert, flakes and several scrapers of quartz were found. The quartz is of a good quality, is quite glassy and probably originated in a Shield location to the north of the site. There is one flake of a fine-grained quartzite that also likely derived from north of Wasaga Beach. Lastly, there are a few flakes of non-siliceous materials, including a green, fine-grained material, probably slate, and a coarser-grained brown sandstone.

Debitage. The distribution of chert flakes is illustrated in Figure 7; the number of items representing by-products or waste flakes is 122 (Table 6). A large proportion of these (50 percent) are small, blocky, irregular shatter fragments resulting from bi-polar reduction of the poor-quality cherts used at the site. There are only a few examples of thin, complete flakes (9 percent of the total). Many of these bear thinned striking platforms, crushed at both the proximal and distal ends. There is cortex on one or more surfaces and other signs which indicate reduction by hard hammer percussion or bi-polar technique. There are an additional 35 (28 percent of the sample) flake fragments. Mean size of measurable flakes is 16 mm by 15 mm by 4 mm, with a range in length from 8 mm to 33 mm, width from 7 mm to 32 mm, and thickness from 1 mm to 8 mm. Twelve small retouch flakes were recovered. These are small thinning flakes resulting from later stage modification of tools and appear to have been struck by both hard and soft percussion and pressure techniques. The average size of these flakes is 9 mm × 8 mm × 1 mm, with a range from 5 mm × 2 mm × 1 mm to 15 mm × 10 mm × 2 mm. In addition to these small flakes, there is one flake of good-quality, white, translucent chert or cherty material which bears a bifacial striking platform, indicating detachment from a previously prepared bifacial tool or preform. It is 9 mm × 4 mm × 1 mm in dimension. There are four examples of pebbles or pebble fragments.

Quartz. The distribution of quartz is shown in Figure 7. Most of the quartz debitage was associated with hearth Feature 2. As with cherty materials, the bulk of quartz waste (57 percent) is accounted for by irregular shatter fragments that resulted from bipolar reduction. There are 29 irregular fragments of quartz, four complete flakes that averaged 14 mm × 8 mm × 2 mm in size, and an additional eight unmeasurable flake fragments. There are three quartz cores or core fragments. Two of these are rectangular, parallel-sided cores measuring 21 mm × 9 mm × 9 mm and 19 mm × 8 mm × 5 mm. The third is a wedge-shaped exhausted core (pièce esquillée), 24 mm by 27 mm by 8 mm in size.

Quartzite. A single small flake of quartzite bears a bifacial striking platform. It is 10 mm × 8 mm ×1 mm in size.

Non-Siliceous Flakes. There are 14 irregular flakes of shale and sandstone that may or may not represent the result of intentional detachment by percussion or other techniques.

Utilized Flakes. Only one dark grey shatter fragment and one flake of quartz bear any evidence of post-detachment utilization.

Flaked Stone Tools. Few complete tools were found. There are no projectile points and only a small number of bifacially worked tool edge fragments. Unifacial scrapers form the largest class of lithic tools. Scraper metrics are available in Table 7.

Simple End Scrapers. There is one complete example of a simple end or "thumbnail" scraper made on a thick flake or shatter fragment. One end had been steeply retouched to form a scraping edge. The raw material is a grey chert with cortex adhering on the dorsal face of the scraper.

There are three additional fragments of tools identified as simple end scrapers. All three had been damaged by heat but exhibit remnants of

Table 7. *Scraper metrics by raw material.*

Items	Length (mm)	Width (mm)	Thickness (mm)	Edge angle	Raw material
	16	20	6	80°	Grey chert
	18	–	5	70°	Dark grey chert
End scrapers	18	–	6	75°	Mottled grey chert
	–	17	6	70°	Quartz
	–	13	4	80°	Quartz
	–	–	–	80°	Kettle Point chert
Spurred end scraper	12	14	3	75°	Grey chert
Thick end scraper	28	23	12	90°	Grey chert
Side scraper	20	15	4	65°	Quartz
Double end scraper	23	16	6	70°/70°	Quartz
Two-edged scraper	26	24	13	80°/65°	Grey chert
Mean	23	19	9	77°	

their scraping edges. Raw materials are Kettle Point chert, a dark grey chert, and a poor-quality mottled grey chert.

There are two simple end scrapers made of quartz. Both are broken specimens, but they exhibit steeply retouched, unifacial scraping edges.

All six scrapers exhibit steeply retouched scraping edges with crushing of the functional edge.

Spurred End Scraper. One diminutive thumbnail scraper of grey chert exhibits a unifacially retouched scraping edge on its distal end and a spur on one lateral side. The spur is continuous with the scraping edge and had been made by unifacially notching the lateral edge of the flake. The side of the flake appears to have been utilized, but not intentionally modified to form a scraping edge.

Thick End Scraper. One thick fragment of mottled chert had been steeply retouched at one end. The specimen appears to have been a pebble or chert nodule from which flakes had been removed. The proximal end had been thinned and was crushed, and the distal end had been modified to form the scraping edge. The functional edge is also crushed.

Double End Scraper. One thick flake of grey chert had flakes removed from both the proximal and distal ends to produce a double end scraper. The functional edges are crushed, and there is evidence for the utilization, but not intentional retouch of, both lateral edges.

Two-Edged End Scraper. One thick flake bears two functional scraping edges on its distal end. There is cortex adhering to the dorsal side of the flake. The proximal end was crushed. At the distal end, small flakes had been removed to form two scraping edges; their functional edges had been crushed.

Side Scraper. One flake of glassy quartz had one lateral edge steeply retouched to form a scraping tool. The functional edge is crushed.

Large Core Scraper. A large, thick flake or core fragment of white chert bears a steeply retouched distal end and extensively utilized, but non-intentionally modified, lateral edges. The functional edge of the scraper is crushed.

Unclassified Scraper Fragment. One fragment of heat-fractured Kettle Point chert has a bifacially worked edge and is considered to be a small scraper fragment.

Drill Scraper. A large, flat-platformed flake of a streaky grey chert was found that tapers to a point

at its distal end. One lateral edge had small flakes removed unifacially on its ventral face, while the opposite edge had flakes removed unifacially on its dorsal face. The distal tip is worn. This specimen is likely a scraper or flake drill.

Graver. An irregular, thick fragment of white chert has two areas of steep retouch and crushed edges, separated by a spur. The spur is rounded through use wear. The item is likely a graver.

Pièces Esquillées. Two wedged-shaped fragments of chert, each with two opposite ends crushed, are exhausted cores or pièces esquillées. One is a speckled white chert, the other a grey chert pebble fragment with cortex adhering to one face.

Fragments of Bifacial Tools. Three edge fragments of tools are bifacially flaked. Several fragments of poor-quality white chert were refitted to form a thick biface or preform fragment; it appears to have been fractured by heat. The other two tool fragments are pieces of heat-altered chert featuring bifacially flaked edges.

Lithics Summary. The lithic sample indicates that the site occupants were predominately using poor-quality local cherts of pebble or nodule form, collected from nearby tills. Good-quality exotic cherts were also being imported in small quantities, notably Kettle Point chert from the southeast shore of Lake Huron. The good-quality, glassy quartz was probably derived from a Shield location to the northeast.

Diagnostic lithic artifacts are absent, with simple end scrapers forming the largest artifact class. Small stone scrapers are an important tool class at other Middle Woodland sites, including Donaldson, Thede, and Inverhuron-Lucas of the Saugeen Focus (Finlayson 1977:567) and Harris Island (BbGm-3) of the Point Peninsula Focus (O'Brien and Spittal 1976:53). At the Jackson's Point site (BdGa-l), a late Middle Woodland site at Charleston Lake, end scrapers and graver–scrapers were the dominant tool type (Spittal 1974:14). Spurred end scrapers and graver–scrapers were also found at Harris Island.

All of the scrapers were formed by steep retouch, and all functional edges are moderately to considerably crushed. Edge angles are consistently steep, ranging from 65 degrees to 90 degrees. The modification of bone and wood likely involved tools with high edge angles as well as the two spurred scrapers. Hide working is a probable activity as well. Utilized flakes are rare (N=2), and short-term use of sharp edged flakes for cutting soft tissues or similar activities are not indicated.

Examinations of the lithic samples from other Middle Woodland components in the immediate area indicate that local, poor-quality cherts were commonly used by the area's inhabitants. Almost every site yielded a few flakes of Kettle Point chert in their assemblages, which indicates limited but consistent associations with Saugeen peoples to the west, who used this type of chert in preference to other types. Generally speaking, the lithic industry of the lower Nottawasaga River area appears poorly developed.

Faunal Remains

Preservation of bone at the site was poor, and the faunal sample is limited to a small number of calcined fragments. There are 100 small pieces of bone, with a total weight of 19 g. Almost all of the bone was associated with hearth Feature 1; Figure 7 illustrates the distribution of bone fragments.

All 100 fragments appear to be mammalian, with further identification to species rendered difficult by the small size of the pieces. One articular facet of a thoracic vertebra was identified as white-tailed deer, *Odocoileus virginianus*, and several alveolar fragments as portions of a maxilla of a Canis species. The remaining specimens are largely long bone or extremity bone fragments. Small to medium-sized mammals are indicated.

Native Copper

One rolled, round bead of native copper was recovered approximately 50 cm west of hearth Feature 2. It is 4 mm in length by 4 mm in outside diameter.

Area B

In 1977, six one-metre squares were opened 5 m to the west of the main area of excavation (see

Figure 2). Pottery had been noted on the surface in this area on the crest of the same sand ridge as Area A. Seventy potsherds, a few pottery crumbs, and one chert scraper were recovered. The collection represents a small part of one ceramic vessel. All sherds are body sherds. Temper consists of crushed fragments of feldspar with an average size of 2 mm; they appear on both interior and exterior surfaces. The paste is well knit, with breaks occurring along coil lines. Several coil breaks show a notched or scalloped coil juncture. Surface texture of this vessel is gritty. Exterior decoration consists of parallel, left, pseudo–scallop shell stamped obliques. The design was fairly well applied but indistinct due to surface wiping or erosion of the fragments. The pieces are dense in texture and heavy for their size.

One unifacial chert scraper of grey Gull River chert was found. The distal end and one lateral edge bear steep retouch that formed a scraping edge. The tool measured 29 mm × 23 mm × 6 mm. The edge angle is 65 degrees.

This small deposit was separated from the main area of excavation by a sterile zone and was considered to represent a small but separate component.

Area C

Area C is located approximately 15 m southwest of Area A on the same sand ridge (see Figure 2). During salvage excavations along the west side of Woodland Drive in 1979, the appearance of pottery on the east side of the road cut prompted recovery of that material by shovel and screen. Ceramics were recovered from the eroding embankment in two places. Fragments of at least three vessels were recovered.

Ceramics

Vessel 1. Vessel 1 is represented by 75 sherds and small pottery crumbs. The temper is crushed feldspar and granite and is visible on both interior and exterior surfaces. Particle size ranges from 2 to 8 mm, with an average size of 5 mm. The vessel was coiled in construction with a poorly knit paste and a crumbly texture. Surface cracks are abundant.

Two mended sherds bear decoration on their interior and exterior surfaces and are considered to represent near-rim fragments. Interior decoration consists of indistinct right obliques, probably executed with a coarse dentate stamp. Exterior decoration consists of at least three rows of parallel, horizontal dentate stamps, followed below by one horizontal line in dentate stamp and one indeterminate design element. In profile, the fragments indicate an outflaring rim shape. Other decorated sherds include design elements of left, coarse, dentate stamped obliques above three horizontal, parallel, dentate stamped lines above a narrow undecorated band, above a horizontal band of coarse, dentate rocker stamping. Other sherds display right obliques above horizontal lines, and several bear horizontal rows of punctates. The designs were only moderately well applied. Surface finishing techniques indicate smoothing of plain interiors, and surfaces are fairly regular. Sherds range from 8 to 11 mm in thickness, with an average of 10 mm. The near-rim fragment is 7 mm at its narrowest (superior edge) and rapidly expands to 10 mm in thickness.

Vessel 2. Vessel 2 is represented by one rim fragment, with a slightly outflaring, thinned profile. Interior decoration consists of left obliques of scratched or deeply wiped lines. The lip was missing. Exterior decoration consists of parallel rows of short, right, dentate stamped obliques, dragged from left to right. This small sherd has a well-knit paste with small amounts of crushed feldspar and quartz temper. The interior surface had been smoothed. Thickness is 3 mm near the lip and 6 mm at its widest point.

Vessel 3. Forty sherds representing Vessel 3 were recovered a metre or so to the south of the Vessel 2 concentration. Four sherds are decorated; the remainder are plain and smoothed. Exterior decoration consists of at least one dragged dentate stamp horizontal line above right, dentate stamped obliques, above another series of four identical horizontal lines, above at least two horizontal lines of evenly spaced punctates, placed with a dentate tool. All of the decoration was neatly applied. The vessel was coiled and has a well-knit paste, and a fine crushed granite temper infrequently shows on

the vessel surfaces. Sherds range from 6 to 9 mm in thickness.

Area D

During the course of excavations in 1977, a small surface scatter of pottery was noted on the exposed west side of Woodland Drive, which extends north–south adjacent to Area A. The pottery was collected at that time. In 1979, Mr. P. Cooke of Wasaga Beach informed the Regional Archaeologist that the municipality was laying a pipeline along the edge of River Road West and Woodland Drive and that trenching would be extended directly through the area that had yielded pottery. Consequently, a crew from the Historical Planning and Research Branch salvage excavated by shovel and screen the exposed west side of the roadway in and around the threatened area. The pottery had been located in the eroding embankment that was a continuation of the same beach ridge on which the main area of the site was situated some 20 m to the east. The area investigated extended about 5 m along the roadside and about 1m into the embankment. Over 200 pottery fragments were recovered, which represented the remains of one vessel. The roadside deposit, which had already been disturbed by road construction, represents a component discrete from Areas A, B, and C.

Ceramics

The ceramics are very friable, and in addition to the analysable sherds, there are a large number of unanalyzable fragments. About 150 undecorated body sherds, 60 decorated sherds, and 4 rim fragments were recovered.

The paste of the vessel is very poorly knit, with sherds which seem to have split and exfoliated or fragmented at temper inclusions, which consists of a large amount of crushed granite that is visible on the vessel surfaces. Temper fragments range in size from 3 to 10 mm, with an average of 6 mm. There are four small fragments of rim. The vessel is outflaring, with a flat lip. Lip thickness is 7 mm. Interior decoration consists of parallel, left, dentate stamped obliques. The lip is decorated with the same dentate tool, which had been applied in an encircling line around the lip. Exterior decoration consists of right, dentate stamped obliques. Exterior decoration on body sherds are noted on 62 fragments. There are at least three horizontal, more or less parallel dentated lines above, with rocker stamping below. Below the rocker stamping, the vessel surfaces are plain, except for wiping striae that appear on almost all of the sherds. The decorative tool in all cases was a coarse, rectangular, dentate tool, and in all cases it had been carelessly applied. Surfaces show frequent cracks and are generally uneven, especially on the vessel interior. There is some evidence of surface smoothing. Sherds range in thickness from 8 to 14 mm, with a mean of 12 mm. The vessel was manufactured by the coiling technique.

Regional Comparisons

The Middle Woodland complex is widespread in southern Ontario. In New York State, the period has been defined by Ritchie (1951), with the Point Peninsula series divided into four foci. Traditionally, many components of the Middle Woodland period in southern Ontario have been subsumed under the heading of Point Peninsula II, which includes the Vinette 2 ceramic assemblage. Investigations by Wright and Anderson (1963) and Finlayson (1977) identified an important focus of the period, the Saugeen Focus, which occupied the eastern shore of Lake Huron and parts of southwestern Ontario. The focus, also termed a "culture" by both Wright and Finlayson, differed from the Point Peninsula Focus with respect to certain important attributes of ceramic manufacture and decorative motifs. Stothers (1975) suggested that two additional, regionally distinct manifestations of the Middle Woodland existed in southern Ontario. These he called the Niagara Peninsula Focus, confined to the area between the western end of Lake Ontario and Turkey Point on Lake Erie, and the Western Basin Middle Woodland, confined to the extreme southwestern part of the province. Arthurs (1972) examined ceramic and non-ceramic traits of eastern Ontario Middle Woodland components and suggested there was sufficient evidence to separate New York State Point Peninsula Focus

sites from Ontario Point Peninsula sites. He proposed a new designation for the Eastern Ontario sites, the Trent River Focus (Arthurs 1972:13). Within the Point Peninsula II Focus (the Trent River Focus), Johnston (1968) defined the Rice Lake Phase. Finally, the series of sites centred on the lower Nottawasaga River has been called the Nottawasaga Focus by O'Brien (1974) and Conway (1975). There were, therefore, at least five regionally distinct Middle Woodland manifestations in southern Ontario.

With its ceramic assemblage characterized by coiled, dentate stamped and pseudo–scallop shell stamped vessels, the Blueberry Field site is readily assigned to the Middle Woodland period. It is one of a number of known Middle Woodland sites in the general area of the lower Nottawasaga River. Iroquoian and Contact-period sites exist in the same area, but it is obvious that the major occupation of the area was by Middle Woodland peoples. The analysis of the site and a comparison with other sites nearby allows for the examination of the nature of this important manifestation of the Middle Woodland period.

The clusters of sites on the Nottawasaga River were approximately midway between two Middle Woodland foci—the Saugeen Focus to the west and the Point Peninsula, or Trent River, Focus to the east. There are recognised differences in the ceramic and non-ceramic assemblages of these two foci that indicate they were distinct regional manifestations within the Middle Woodland period. The archaeological sites in the Nottawasaga River area were isolated from both these foci, and the designation Nottawasaga River Focus has been proposed for the sites in this area. In order to establish the characteristics of sites in the Wasaga Beach area, examination of Saugeen, Point Peninsula, and Nottawasaga traits was deemed necessary. Unfortunately, the artifact assemblage recovered from the Nottawasaga River area is the result of limited survey by surface collection and limited test and salvage excavation. Only three components have seen excavation of any extent. The samples recovered consisted mainly of ceramic fragments in small numbers, with some lithic debris; features were rare or absent. A heavy reliance was placed on the analysis of the ceramic assemblage in order to establish the relationships between sites both within and outside the region. Ceramics, however limited the artifact inventory, represent the most frequently occurring artifact class and exhibit the most extensive and readily observable body of comparable data.

The separation of Saugeen from Point Peninsula was based largely on the differences in their ceramic assemblages. Point Peninsula ceramics are characterized by relatively thin walls with a fairly well-knit paste and moderate amounts of grit temper of a small to medium size. Vessels are commonly constructed using the coiling technique. They display conoidal bases, slightly constricted necks, and slightly outflaring rims. Exterior decoration is most commonly executed with a dentate or pseudo–scallop shell stamp or a cord-wrapped stick. Rocker stamping is also common. The lower portions of the body are most often plain and smoothed (Ritchie 1949). Alternatively, Saugeen ceramics are characterized by vessels with a poorly-knit paste and medium to coarse grit temper, which is usually abundant. Vessel walls are slightly thicker, with less elaborate surface finishing techniques, and often have a grainy texture (Finlayson 1977:630). Vessels are semi-globular with conoidal bases and have slightly constricted necks and outflaring rims (Finlayson 1977:301). There is strong correspondence not only in the types of decorative techniques used in both the Saugeen and Point Peninsula foci, but also in the variety of decorative motifs (Wright 1963:53). Point Peninsula ceramics differ from those of the Saugeen Focus with regard to paste. Point Peninsula sherds are usually more closely knit, with fewer tempering particles showing on the exterior and interior surfaces of the vessels. Point Peninsula sherds are thinner and tempering particles smaller (Wright 1963:47). The two critical factors that differentiate Saugeen from Point Peninsula rim sherds are the crude decorative techniques and their application on a coarse paste. As a rule, the impressing tools of the Saugeen Focus are larger and perhaps more crude than those that are thought to have been used to decorate Point Peninsula ceramics. Exterior

decorative motifs frequently extend only part way down the body of Point Peninsula vessels, and the lower portions are typically plain. Overall decoration is the rule on Saugeen ceramics. There is a marked difference in the popularity of certain motifs between the two foci. Criss-cross motifs and the combination of two or more decorative motifs are relatively common on Saugeen ceramics but rare on Point Peninsula sherds. Obliques and horizontals are dominant motifs in both (Wright 1963:47). In order to analytically compare the Nottawasaga River Focus sites with those of the Saugeen and Point Peninsula foci, it would, therefore, be necessary to examine the thickness of vessel walls, paste, temper size, temper presence on the surface of vessels, surface treatments, exterior motif, the tools used to make them, and the extent of exterior decoration.

Exterior decorative motifs are obviously an important aspect of any ceramic comparative analysis. Unfortunately, the sample sizes of Nottawasaga River Focus ceramics are very small. There are few rim sherds which display more than a small portion of upper rim decoration. It has, therefore, been difficult to compare Nottawasaga River material to that from larger, more fully excavated sites of the Saugeen and Point Peninsula foci farther afield. Indeed, a comparative ceramic analysis could not proceed at this time with comparable datasets; however, the above-listed attributes of vessel manufacture and decoration could form the basis for any future site comparisons.

Regional Site Descriptions

Figure 8 displays the area of the lower Nottawasaga River and the cluster of Middle Woodland sites now known to exist. The sites are described herein with respect to ceramic attributes and are compared with sites of the Saugeen and Point Peninsula foci. Important Middle Woodland components that are compared with the Nottawasaga River sites are shown in Figure 9.

The Schoonertown site (BcHa-18) is an important component, having been subject to test excavations in 1973 and 1974 by crews of the

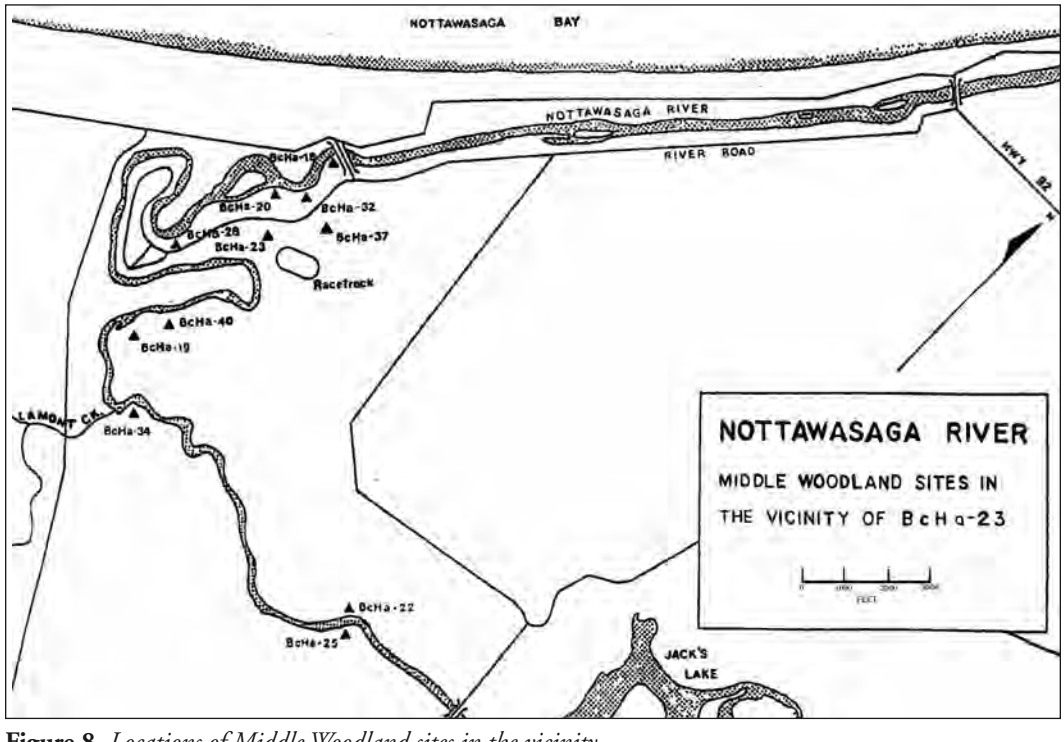

Figure 8. *Locations of Middle Woodland sites in the vicinity.*

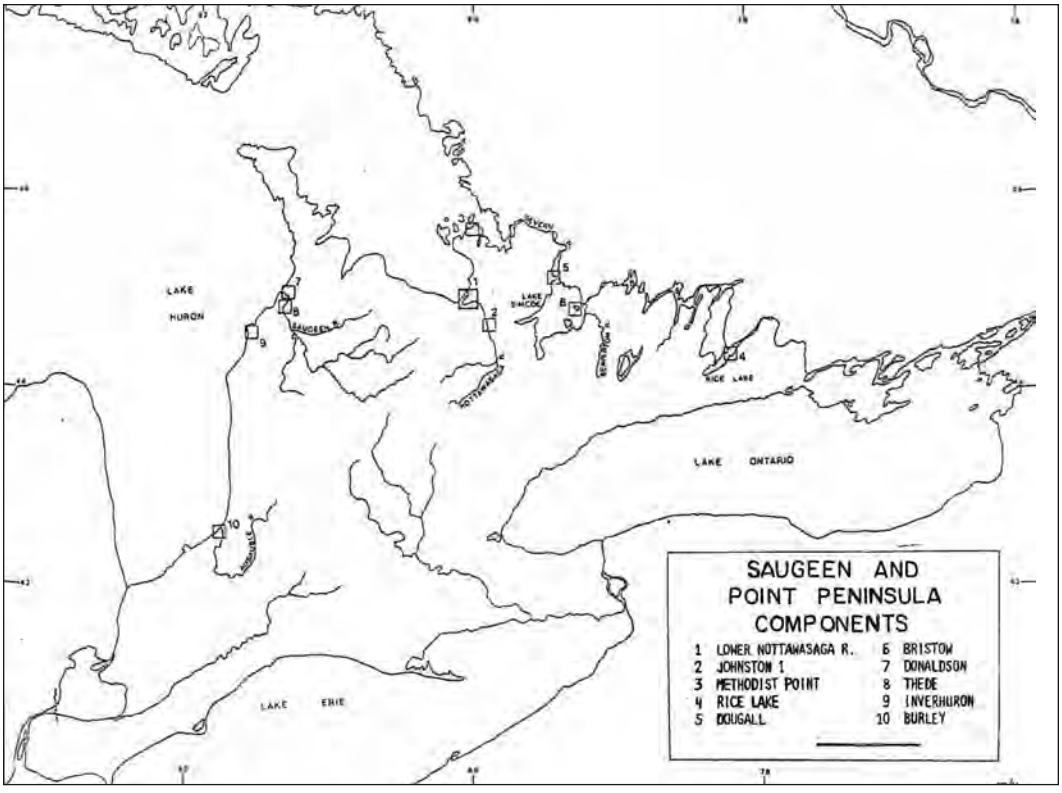

Figure 9. *Locations of Saugeen and Point Peninsula components in the vicinity.*

Historic Sites Branch, Ontario Ministry of Natural Resources. Two middens and a habitation area were tested (Conway 1975). The site is multicomponent, with a substantial Middle Woodland component overlain by lroquoian and British occupations. The Middle Woodland ceramics are friable and characterized by coarse quartz and feldspar temper that appears in abundance on both interior and exterior surfaces. Almost all sherds show coil breaks; a few mortise and tenon breaks were noted. Generally, the vessels include flat and bevelled lips, a preference for oblique lip decoration, a considerable variety of interior decoration usually restricted to one row just below the lip, and various frequencies of interior channelling and exterior brushing (Conway 1975:3). Vessels tend to have decoration over all of the exterior surfaces. Some are zoned, and two decorative techniques are usually used on one vessel. Most bases are rounded, but conoidal forms do occur. Dentate stamping is a popular technique, followed by pseudo–scallop shell impressions. Rocker stamping, incisions, plain ware, and fabric-impressed are minority types (Conway 1975:4). Non-ceramic items include small amounts of cut mica and copper. In the lithic sample, grey Gull River chert predominates, with small amounts of Kettle Point chert (Conway 1975:4). Overall decoration on vessels with coarse temper and poorly-knit paste and crudely applied dentate and pseudo–scallop shell stamp indicate it was a component of the Saugeen Focus. It had been identified as such by Finlayson (1977:608) and Conway (1975:6). Conway (1973, 1975) assigned the site to a new taxon, the Nottawasaga Focus. It should be noted that Smith (1974), in her analysis of House Area ceramics from Schoonertown, noted that several vessels more closely resemble Point Peninsula (Trent River Focus) ceramics than Saugeen Focus ceramics. A

high percentage of undecorated sherds indicates that much of the vessels were left undecorated, and some very finely executed designs appear on relatively thin, well-knit pottery. The Schoonertown site thus exhibits Saugeen characteristics, with some relationship to Point Peninsula indicated. Smith summarized the Schoonertown ceramics as providing a picture of a Saugeen component but with some, even considerable, Point Peninsula II influence (Smith 1974:15).

Located a short distance to the west (upriver) from Schoonertown is the Wasaga Beach II site (BcHa-20). This site represents another fairly large component and has been identified as Saugeen by Finlayson (1977:608). The ceramics housed in the Historical Planning and Research Branch South Central Region and available to the author indicate both Saugeen and Point Peninsula attributes. Different sherds exhibit pastes both poorly and well knit, with well knit more common. Temper is usually abundant and medium to coarse in size, occurring infrequently on the surface of the vessel. Particles in the smaller size range are more common. Decoration consists of pseudo–scallop shell and dentate stamp, mostly obliques and horizontals. Application is deep and poorly executed in some cases, but other cases exhibit careful application of decorative motifs with fine tools. There are a large number of plain sherds that indicate decoration had not covered the entire vessel. This site, like the nearby Schoonertown site, has attributes of both Saugeen and Point Peninsula Focus ceramics.

Smaller components in the same area include the Rousseau site (BcHa-32), which is located on a small sand dune south of the Nottawasaga River, midway between the Schoonertown and Wasaga Beach II sites. The ceramics recovered from this site exhibit straight and slightly outflaring rims, with flat and rounded lips. Vessel walls are relatively thin. The sherds are crumbly, with medium to coarse temper in large amounts that is evident on both interior and exterior surfaces. Surface cracks are abundant, and the surfaces of the sherds are gritty and unsmoothed. The sherds are mostly coiled, with a fairly well-knit paste, but they are crumbly due to the large temper size. Exterior decoration consists mostly of obliques and horizontals executed in pseudo–scallop shell and dentate stamp, which are fairly deeply impressed into the clay. There are a large number of plain sherds, which indicate decoration had not been applied beyond the upper vessel. The crumbly pottery with large amounts of coarse temper; unsmoothed, gritty vessel surfaces; and deeply impressed designs are similar to Saugeen-style vessels, but the relative thinness of the walls and the lack of overall decoration are Point Peninsula traits. The site thus also exhibits attributes of both foci, with Saugeen influence dominant.

Farther south of the Rousseau site is the Racetrack site (BcHa-37). Ceramic fragments from this component exhibit coiled vessel construction with thick walls, coarse grit temper in large amounts evident on both surfaces, poorly-knit sherds that exhibit surface cracks, and unsmoothed sherds with a gritty surface texture. Extensive decoration consists of coarse, rectangular dentate and rocker stamping, which had been crudely applied. These ceramic traits are more consistent with Saugeen Focus–style vessels.

Located upstream on the Nottawasaga River at the embouchure of Lamont Creek is the Lamont Creek 1 site (BcHa-34). The ceramics recovered represent the remains of one vessel, which is slightly outflaring, with a flat lip. Sherds have a crumbly paste with medium to coarse angular temper in moderately large amounts, evident on both vessel surfaces. The interior surface is very uneven and shows deep finger marks overall. The exterior decoration is cord or fabric impressed, with carelessly applied and superimposed incised lines. Attributes of manufacture relate most closely to the Saugeen focus, while cording on the exterior suggests a separate or later manifestation of the period.

Additional Middle Woodland components were located several kilometres upstream, on the banks of the Nottawasaga River. The Fiddler's Dream site (BcHa-25) yielded fragments of coiled vessels exhibiting crumbly, poorly-knit paste with medium to coarse temper in moderately large amounts and with gritty surface textures. On the opposite bank of the river, the Gordon site (BcHa-

22) yielded thick-walled and coiled vessel fragments that have medium to coarse temper in large amounts, with cracked vessel surfaces. There is some smoothing of sherd surfaces, but surface finishing techniques were poorly executed. Exterior decoration consists of coarse, crudely applied, dentate stamps. Both of the above Middle Woodland sites could be readily associated with the Saugeen Focus, as they exhibit few or no Point Peninsula attributes.

Farther south (upstream) on the Nottawasaga River and south of Jack's Lake is the Fisherman site (BcGx-6). This site was test excavated in 1974 by R. O'Brien of the Ministry of Natural Resources. The ceramic assemblage is characterized by thick-walled pottery manufactured by the coiling technique. Paste is predominately poorly-knit, but there are some well-knit examples. Temper size ranges from fine to coarse, in moderate to large amounts. Particles show on vessel surfaces only infrequently. Surface textures are both gritty and smooth, while the latter are more common. Decoration consists of coarse, dentate stamped obliques and horizontals and coarse rocker stamping. Application is generally crude, with obliteration of the design by subsequent wiping or smoothing. There are only a small number of plain sherds, indicating that decoration may have encompassed most of the exterior surface. Saugeen associations are indicated by attributes of vessel thickness, tool type, crudity of application, and extent of vessel decoration.

Other Middle Woodland components on the lower Nottawasaga River include the Bridge site (BcGx-4), where the small Saugeen-like ceramic sample displays round dentate and coarse rocker stamping, which had been crudely applied. Vessel sherds are thick and bear a coarse temper (O'Brien 1974:87).

In addition to small campsites and larger habitation areas, there are several burial sites of the Middle Woodland period in the sandy dunes of the lower Nottawasaga River. The Harpoon Burial site (BcHa-30) is located on the banks of the Nottawasaga River several miles upstream from the river's mouth. Its exact location is unknown. The burial was excavated by K. Kidd in about 1950. Included as grave goods were antler-hafted beaver incisors and socketed antler projectile points. The burial was considered to be Saugeen (Conway 1975:7). Grave goods in burials at the Donaldson site included an antler-hafted beaver incisor (Finlayson 1977:276). Located to the west and upstream from the Harpoon Burial site is the Second Dune Burial site (BcHa-40). Human skeletal material was removed from this disturbed locale on several occasions (O'Brien 1975; Spittal 1981). Chert flakes and a few coarse fragments of pottery were recovered from the area in 1975. In 1978, a human cremation was found a few metres away. Included as grave goods in this burial were a ground stone celt, two large pointed antler spikes, two pointed antler tips with drilled holes, several slender bone awls or projectiles, two elk canon bones split longitudinally, and several juvenile mammal bones. Very similar antler and bone grave goods were recovered from burials at the Donaldson site. Antler club spikes were found in Burials GF and I, toggling harpoons of antler were found in Burial GF, canon bone beamers were found in Burial I, and bone awls were included in both burials. Cremation (partial) was also indicated in Burial GA at Donaldson (Finlayson 1977:263).

The Second Dune Burial site, at Wasaga Beach, shows a strong affiliation with Saugeen burial practices, although the burial is located in an elevated dune and not in a habitation area, as at Donaldson. It was dated to about A.D. 100 by its similarity to radiocarbon-dated material from Donaldson (Spittal 1981). Human bone was recovered from the habitation area at Wasaga Beach II. Located in the nearby dune area is the Dune Burial (BcHa-19), which contained the remains of two juvenile individuals. Chert flakes were found around the burial. This interment may or may not represent a Middle Woodland component.

This examination of regional Middle Woodland sites was mainly concerned with attributes of ceramic manufacture and the application of decoration and not with the decorative motifs themselves. Small, fragmentary samples preclude reliable observations on exterior decorative motifs. The pottery could not be placed in a known series of types on the basis of rim and

body decoration. Instead, a general examination of temper, paste, and design application has been used to suggest the dominant cultural affinities of the various components, based on the premise that it is these ceramic attributes which most readily distinguish Saugeen from Point Peninsula Focus sites. Wright (l963:47) and Finlayson (1977:631) summarized these non-motif variables as the most important and distinct traits that best separated the ceramics of the two foci.

Regional Assessment

The area of the lower Nottawasaga River is situated between two Middle Woodland manifestations, the Saugeen Focus (or Culture) to the west and the Point Peninsula Focus to the east. Important components of the Saugeen Focus include the Donaldson (BdHi-l), Thede (BcHi-7), and the Inverhuron-Lucas (BbHj-3) sites to the west of Wasaga Beach; the Burley site (AhHl-2) on or near Lake Huron; and components along the Ausable River, such as the Vandenbygaart (AhHl-15) and Cutler (AhHk-3) sites. It is apparent that certain sites along the lower Nottawasaga River were also fairly pure components of the focus. These include Area D of the Blueberry Field site, as well as the Racetrack, Fiddler's Dream, Gordon, Bridge, and Second Dune Burial sites. To the east, Point Peninsula sites are numerous and include the East Sugar Island (BbGm-11), Serpent Mounds (BbGm-2), Harris Island (BbGm-3), Kant (BjGg-l, BjGh-l), and Malcolm (BgFq-2) sites. Many other Point Peninsula components have been reported. It appears that some of the lower Nottawasaga River Middle Woodland sites could be included as additional components of this focus. These include the other areas of the Blueberry Field site, and parts of the Wasaga Beach II and Schoonertown sites, which were multi-component.

An overall evaluation of the lower Nottawasaga River sites indicates that there was an observable mixing of influences from both the Saugeen and Point Peninsula areas. The region centred on the river at Wasaga Beach could be viewed as a region of interaction between the two foci, where peoples at the farther reaches of their cultural homelands came into contact with their neighbours. The overall similarity of ceramic motifs illustrates the basic genetic relationship between the Saugeen and Point Peninsula II foci (Wright 1963:46). Finlayson suggested the Saugeen peoples were a separate culture with a distinct adaptation confined to the southwestern part of the province. He also suggested the Saugeen Culture sites to the south of the Bruce Peninsula locality (i.e., Donaldson) would show more evidence of contact with the Point Peninsula cultures of New York State and southeastern Ontario (Finlayson 1977:610). This suggestion may also be extended to the area east of the Bruce Peninsula, where the lower Nottawasaga River appears to be an area of association between the two cultures. This conclusion was based solely on an examination of select attributes of ceramic manufacture and the application of decoration.

The area under consideration (and any designation applied to the culture found there, such as Nottawasaga Focus) could be characterized as a Middle Woodland manifestation which shared ceramic attributes of both the Saugeen and Point Peninsula foci. Saugeen-like traits, including both ceramic and burial traits, appears to be dominant in the area's artifact assemblage. The number of non-ceramic traits in the Nottawasaga River area is presently small but includes the use of Kettle Point chert, albeit in small amounts, on several sites in the area. The use of this type of chert is an important characteristic of Saugeen Focus sites to the west. Small amounts of this type of chert are also found on Point Peninsula sites much farther to the east, as at Harris Island (O'Brien and Spittal 1976). This indicates fairly far-reaching trade associations between the two foci.

The extent of the region of interaction between the foci remains unknown, but these data suggest that the Nottawasaga River drainage formed the boundary between the two groups. Located a short distance to the north and east of Wasaga Beach is the Stockin site (BfHa-4), at Methodist Point. The Middle Woodland component at the site revealed coiled pottery with medium to coarse temper in moderate amounts which rarely shows on vessel surfaces. Decoration

consists of pseudo–scallop shell, push-pull, and dentate stamp, generally neatly applied. The lower halves of the bodies are plain and carefully smoothed. The pottery has some characteristics which are intermediate between Saugeen and Point Peninsula pottery. It was suggested it belongs in the Point Peninsula rather than the Saugeen series (O'Brien 1976:65). A short distance up the Nottawasaga River is the Johnson I site (BcGx-1), located at the southeastern end of the Minesing Swamp. The location is about 19 km upstream from the mouth of the Nottawasaga River at Georgian Bay. That multicomponent site contained a substantial Middle Woodland component. Ceramics show a fairly well-knit paste with moderate-sized temper that does not frequently show on vessel surfaces. Decoration consists of fine dentate stamp, dragged stamp, and cord-wrapped stick, neatly applied. It appears to be a more classic, possibly late, Point Peninsula II site (William Ross, personal communication, 1981).

A few miles to the east of the Nottawasaga River drainage is the Dougall site (BdGu-2) located on the east side of the narrows between Lakes Simcoe and Lake Couchiching. Excavation of this multicomponent site by Wright (1972) revealed pottery that, with a few exceptions, had been decorated with finely notched tools, neatly applied. There were also a fairly large number of plain sherds (Wright 1972:4). This also appears to be a "classic" Point Peninsula site. Located on Thorah Island in Lake Simcoe and opposite the Talbot River (Trent Canal) is the Bristow site (BcGt-1). Excavation of this site by Sweetman (1967) revealed Middle to Late Point Peninsula pottery which resembled in detail the Point Peninsula material from the Rice Lake and Trent River areas (Sweetman 1967:10). Sweetman (1967:11) alluded to another similar site at the mouth of the Beaver River.

These few examples of Middle Woodland components suggest that the interaction of Saugeen and Point Peninsula peoples was in large part a phenomenon restricted to the lower part of the Nottawasaga River drainage and the shores of Georgian Bay; at this time it seems that the area of association does not extend a great distance to the east or south. It is presumed that Middle Woodland sites were progressively and rapidly more Point Peninsula–like to the south and east of the Wasaga Beach area and that they were progressively more Saugeen-like to the west. Further excavation and analysis of material from the lower Nottawasaga River area could prove valuable in more clearly assessing the relationships between the two foci in this area and in defining the nature of the people living there.

Temporal and Cultural Placement of the Blueberry Field Site

Investigations in the area of Wasaga Beach in the past have not revealed a continuous archaeological record of occupation of the area in precontact times. There is abundant evidence of occupation of the area during the Middle Woodland period and more limited but ample evidence for Late Woodland times. The earliest Late Woodland site appears to belong to the Middleport substage, at about A.D. 1300–1400. While there is a record of Petun-Huron use of the area, there is lack of evidence for an Early Iroquoian presence, between A.D. 800 and 1300 (O'Brien 1974:44). It has been suggested that the area was repopulated, during the fourteenth century, due to increasing population pressures in the south (O'Brien 1976:92). Thus, there was substantial occupation of the area during Middle Woodland times, after which the area was abandoned until Middleport times. There is evidence to suggest a similar pattern of occupation in the area of the east shore of Lake Huron and Bruce County, where there had been a major occupation by Saugeen peoples until about A.D. 800 and then an apparent gap in the archaeological record until minor Iroquoian migration into the area at approximately A.D. 1350, which was evidenced by the Middleport substage Nodwell site (Finlayson 1977:605). The late developments of Middle Woodland cultures and the transition to Late Woodland are not well understood for most of the province.

There is no firmly established chronology of the occupation of the lower Nottawasaga River in which to place the Blueberry Field site. Radiocarbon dates have not been run for any of

the components, and existing artifact samples are small and fragmentary in most cases. This is especially true for ceramic remains, which generally form a reliable basis for the dating of sites. Fairly large samples of ceramics have been retrieved from the Schoonertown and Wasaga Beach II sites; however, these probably represent spring camps with repeated occupation for short periods of time. Their ceramic assemblages most likely represent many components; indeed, there is evidence to suggest occupation by both Saugeen and Point Peninsula foci peoples during the same general period.

It is assumed that the pottery of the lower Nottawasaga River, which has attributes of both Saugeen and Point Peninsula foci, represents a mixing of influences from both cultures and that the thinner, better-knit vessels with more finely executed designs are more or less contemporary with the thick-walled, coarse-tempered, more crudely decorated vessels found in the same area. It is not suggested that the more finely made (Point Peninsula–like) pottery was a later development than the coarse (Saugeen-like) ware. Although the samples are small, it is the ceramics of Wasaga Beach II that were the most useful in determining the temporal placement of the various components, including Blueberry Field. In the absence of radiocarbon dates, only a general chronological ordering of the sites has been possible.

Analyses of ceramics from Saugeen and Point Peninsula sites in southern Ontario indicate that certain trends in the techniques of vessel decoration are common to both cultures. Wright, in his study of Point Peninsula Focus material, showed that pseudo–scallop shell stamp was a technique that was most popular in the early part of the focus's ceramic series and that dentate stamp was most popular late in the series, the former declining in popularity through time and the latter showing a steady increase in popularity (Wright 1967:122). Finlayson (1977:590), in his analysis of Saugeen material from the Donaldson and Thede sites, demonstrated the same trend in decorative techniques through time. He illustrated that pseudo–scallop shell stamp was the predominant technique of vessel decoration early in the Saugeen Culture and that it decreased in frequency through time and that dentate stamp was a minority technique early on that then increased through time. Finlayson (1977:586) cited evidence based on the frequencies of dentate and pseudo–scallop shell stamped sherds in association with radiocarbon-dated features to suggest that the early pseudo–scallop shell stamped pottery (at Donaldson) dated to an occupation somewhat earlier than 100 B.C.–A.D. 100 and that the late dentate stamped pottery (at Thede) dated to about A.D. 700–800. In the Point Peninsula series, Johnston ordered the pottery from the Serpent Mound site on Rice Lake. The earliest radiocarbon date, of 58 B.C., obtained by Johnston (1968:71) was from the lower shell midden. The habitation area of the site is considered still older by Johnston (1968), based on the seriation of the ceramics. This area produced a high percentage of pseudo–scallop shell stamped pottery (64 percent), which indicates that the technique was early in the series and dates to sometime prior to 58 B.C. (Johnston 1968:39). There is therefore an indication that a high (early) incidence of pseudo–scallop shell stamp is roughly contemporary in components of both the Saugeen and Point Peninsula foci.

Concerning the Wasaga Beach area, Conway (1975:6) undertook comparisons of various Saugeen, Point Peninsula, and Trent River Focus sites and showed that Schoonertown ceramics appear early in the sequence. O'Brien attempted to order known components of the area and concurred that Schoonertown ceramics fall somewhere into an early time frame. Also early, in her opinion, are the Wasaga Beach II, Blueberry Field, and Rousseau sites (O'Brien 1974:39). As for the Blueberry Field site, of the six vessels recovered, five showed predominately pseudo–scallop shell motifs. Although the sample is small, the conclusion was made that it, too, is early in the Middle Woodland series. The site shares attributes of both the Saugeen and Point Peninsula series of pottery, and when the high frequency of pseudo–scallop shell decoration is considered and compared with the frequencies from other sites of the two foci, it is estimated that the occupation of the site dates to about the first century B.C. Other

components in the area yielded such small samples that dating them is not possible. The absence of pseudo–scallop shell on sherds from some sites, however, along with the appearance of dentate stamp and cord-wrapped stick, which is a later Middle Woodland decorative technique, indicate that there are sites of both the early and middle parts of the period on the lower Nottawasaga River.

Summary

Blueberry Field is a small, single component site of the Middle Woodland period. Two shallow hearth features, a small lithic and floral sample, and the remains of at least six ceramic vessels were recovered during salvage excavations at the site in 1977.

The site is located on the lower Nottawasaga River and is geographically about midway between two manifestations of the period, the Point Peninsula II Focus to the east and the Saugeen Focus to the west. Examination of non-motif ceramic attributes, such as temper and paste, suggests that some sites of the area exhibit traits of both foci. The dominant cultural associations of the area sites appear to be with the Saugeen Culture to the west, although Blueberry Field and other nearby components are Point Peninsula–like with respect to temper, texture, extent of exterior decoration, tool type, and neatness of design application.

The ceramic assemblage of the site is characterized by vessels with slightly outflaring rims, weakly developed necks and shoulders, and round or conoidal bases. The vessels were carefully manufactured, using the coiling technique, and are characterized by a well-knit paste and are tempered with small to medium-sized grit in moderate amounts. Decoration is confined to the upper rim on vessel interiors and upper body and rim on vessel exteriors. Vessel bodies below the shoulder are plain and carefully smoothed. There is a recurring sequence of decoration on vessel exteriors, which consists of alternating bands of oblique and horizontal elements, executed in pseudo–scallop shell and dentate stamps. Decoration is neatly applied, with a fine to medium sized tool.

The lithic sample is characterized by poor-quality cherts of local origin reduced largely by the bipolar technique. Quartz is also present on the site. Debitage forms the bulk of the lithic sample, with several scrapers as the only identified tools. Kettle Point chert is present in small amounts, as it is on most other nearby Middle Woodland components, indicating a limited, but consistent, trade association with Saugeen peoples to the west, where it was the preferred type of chert. The presence of other exotic cherts, good-quality quartz, quartzite, and native copper also indicates limited trade with groups from other areas, especially to the north and northeast. Little information could be gleaned from the small, fragmented faunal sample.

Blueberry Field is a small, seasonal campsite occupied by a nuclear family group for a short period. Exploitation of the rich floral and faunal resources of Georgian Bay, the Nottawasaga River, and the sandy dune hinterland is suggested. The site is estimated to date to about 100 B.C. While located in an area where the dominant cultural association appears to be with the Saugeen peoples to the west, the site also exhibits a strong affiliation to the Point Peninsula Focus to the east.

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Editor's Notes (Ronald F. Williamson): In their 1990 summary of Early and Middle Woodland complexes in southern Ontario, Mike Spence, Rob Pihl, and Carl Murphy included one paragraph describing the Schoonertown site, situated on rapids of the Nottawasaga River, seven km from its mouth at Georgian Bay. While Finlayson (1977:608) had also previously drawn attention to both the Schoonertown and Wasaga Beach II sites in his examination of Bruce Locality Saugeen sites, there has never been a published summary of the Middle Woodland sites that are

sometimes referred to as the Nottawasaga Focus, despite the region having been the subject of considerable attention by researchers in the late 1970s. In his report on investigations at the Blueberry Field site, Spittal summarizes it and other Nottawasaga Focus sites and places them in the middle of Saugeen and Point Peninsula complex influences. It should be noted that this document was written well before it was appreciated that there were autonomous Middle Woodland populations on most major drainages in southern Ontario, all with both antecedent and descendant communities.

Le site Blueberry Field (BcHa-23) et plusieurs groupements d'artéfacts associés situés près de la rivière Nottawasaga dans la ville de Wasaga Beach ont été sauvés lors de fouilles en 1977. Les artéfacts récupérés incluent des morceaux de six récipients de céramique et des petits échantillons lithiques et zoologiques. Deux vestiges de foyers ont aussi été enregistrés. Le site était un petit campement d'élément simple de la période Sylvicole Moyen. Situé dans une région où les associations culturelles dominantes semblent être liées à la culture Saugeen à l'ouest, le site démontre aussi des liens solides avec des sites de culture Point Peninsula à l'est. La région inférieure de la rivière Nottawasaga semble être une région où les peuples des deux cultures étaient en étroite association.

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Profile

Marian E. White (1921 – 1975): Action Archaeologist

Kathryn Leacock and William Engelbrecht

"the Niagara River, now or in the past, presents no major barrier to the interaction of people"
Marian E. White (1976:110)

Marian's death is often quoted as "untimely" (Milisauskas 1977:191, Bender 1992:19). True, her death at just 54 years of age leaves us wondering what additional discoveries she could have made. That said, in her short time as a major force in Niagara Frontier archaeology, her publications were plentiful, her excavations numerous and her personality legendary. While Western New Yorkers may claim White's archaeological acumen as their own, her first foray in the field was at the University of Michigan Field Camp in Killarney, Ontario in 1953 (Figure 1). She returned to Ontario to do both salvage excavation and site reconnaissance. When her focus was on the Niagara region, it encompassed cultural development on both sides of the Niagara River.

Figure 1. *Marian E. White (center), boating in Killarney Bay. Photograph courtesy of the Buffalo Museum of Science.*

Marian Emily White was born in rural Hartland Corners, Niagara County, New York on August 28th, 1921. Her mother Millie Hudson (1883-1945) was a grade school teacher and her father, Ralph E. (1876-1960) was a florist and farmer. They operated the White Brothers Rose Corporation of Medina, one of western New York's largest wholesale rose firms. Marian was a member of the 1938 graduating class of Gasport High School; her formative years were clearly rooted in western New York. Along with her older sister, Ethel (1915-2002), she enjoyed outdoor activities such as camping, canoeing, and fishing; these childhood activities served her well in her chosen career.

After high school, Marian headed east and enrolled at Cornell University, earning her Bachelor's degree in classics with a minor in anthropology in 1942. After military service, she returned to western New York to serve as a science instructor at the Buffalo Museum of Science, leaving in 1952 to advance her formal education (Figure 2). She received her M.A. (1953) and Ph.D. (1956) from the University of Michigan, claiming the title of first

Figure 2. *Marian (right) and fellow Science Guide, Mary Templeton, in their office at the Buffalo Museum of Science. Photograph courtesy of the Buffalo Museum of Science.*

woman to receive her Ph.D. in anthropology from the University.

Following a short stint in the anthropology department at the Rochester Museum of Arts and Sciences (now the Rochester Museum & Science Center), Dr. White returned to Buffalo in 1958 where she held a joint position as the assistant curator of anthropology at the Buffalo Museum of Science and a research associate in the Department of Anthropology and Linguistics at the University at Buffalo (Figure 3). This dual position was inspired by her efforts to create a "Program of Archaeological Research for the Niagara Frontier" (White 1958a). The purpose for the establishment of the Niagara Frontier Archaeological Project was twofold (White 1958a):

> To conduct research on the archeology and ethnohistory of the Indian culture of the Niagara Frontier so that:
>
> (a) the archaeological data of this area are not lost completely due to urban and industrial expansion and highway construction.
>
> (b) the archeology of this area may be related to that of surrounding areas to allow a more complete understanding of the Indian culture of the Northeastern United States during the last 5000 or more years.

For many years, Marian White was the only professional archaeologist in New York State west of Rochester. She took this responsibility to heart with her strict field school protocols. While it will

never again be possible to sit and discuss the archaeological process with White, her field journals are a window into her personality, professionalism and underlying humor. For White, copious notetaking was crucial to an excavation.

> An archaeological site cannot be replanted or replaced; the people have died and their culture, transmitted to their descendants, has evolved. An archaeological site can be transported through the scientific excavations and records of the archaeologist (White 1972c:1).

During certain periods of her career, White was excavating multiple sites at once, as her 1959 notes from the Simmons Site illustrate with notations such as "Goodyear in am" (White, 1959). Clues such as "Ritchie Visited" (White, 1959) allude to the close-knit archaeological community. There are 32 field journals on file at The Marian E. White Anthropology Research Museum at SUNY Buffalo from White's excavations of the Simmons Site, an early contact-period site located in Elma, New York. These journals were compiled by 21 different authors. They contain details of every unit opened, when, where, and what the unit contained, providing a clear picture of White's methods and her "continual campaign against sloppiness" (Engelbrecht and Grayson 1978:2). This statement may be true of the excavation site, but the same cannot be said for the living conditions. The crew of the Simmons site lived in a camp in close proximity to the units nicknamed "Camp Swampy". Written accounts describe dysfunctional johnnies-on-the-spot, and the use of bed sheets as sunshades. Shopping lists from the site are also included in the documentary evidence, and so it appears that the inhabitants of Camp Swampy subsisted on bologna, peanut butter, and vodka. At a bar, Marian White's drink of choice was "a vodka martini extra dry with a twist."

White's field journals contain countless pages of triangulation calculations. Her precision for setting stakes using this mathematical method was well documented. White was one of the first

Figure 3. *Marian (left) examines the tooth of a mastodon taken from the Byron site with fellow Buffalo Museum of Science staff members, Curator of Geology Carol Heubusch and Director Fred T. Hall. Photograph courtesy of the Buffalo Museum of Science.*

archaeologists in the Northeast to use statistical analysis for comparisons (Hunt 1986:314). This focus on mathematical and statistical analysis originates from her first appointment after undergraduate work, when White was employed as a statistical clerk at the New York State College of Agriculture at Ithaca. The concentration on statistics continued into her military service. When the United States entered World War II, White joined the Army Air Force as an IBM Tabulator Machine Operator in the Statistical Control Division (Milisauskas 1977:191). Continuing in her graduate studies, Marian credits the noted processual archaeologist Albert C. Spaulding (1914-1990) for his assistance in statistical and methodological procedure (White 1961).

Engelbrecht remembers using McBee cards (edge-notched cards) in conjunction with the SUNY Buffalo site file in the 1960s. These cards had long been in use in libraries, but were a methodological innovation by Marian White for site information retrieval. Today it is a given that archaeological data lends itself to a quantitative approach, but in the mid-twentieth century, before general access to computers, professional archaeologists more often took an intuitive approach to their data. Bender (1992) describes Marian White as a pioneer and this is clearly evident in her quantitative approach.

Marian's academic teaching career began in 1953 as a Teaching Fellow in Anthropology at the University of Michigan. Prior to academia, as a science instructor at the Buffalo Museum of Science, White was responsible for the development and delivery of programs to the Museum's K-12 audience. Images of a young Marian supervising the construction of a papier-mâché stockade and wooden fire starters is a testament to her commitment to educating a broader audience about the past inhabitants of the region. While at the University at Buffalo, she made the climb from lecturer to full professor in just ten years.

Notoriously guarded in her private life, Marian never shared news of her illness with her colleagues. The line between life and work was never crossed. Her battle with cancer remained personal. Although she died on October 31, 1975, at the age of 54, her legacy lives on in the many scholars she mentored, encouraged and challenged.

Theoretical Paradigms

In the early 1940s James B. Griffin of the University of Michigan came to the conclusion that the prevailing scenario of Iroquoian origins needed re-examining (MacNeish 1952:vii). Griffin encouraged Richard MacNeish to undertake this study, which became MacNeish's (1952) landmark work on Iroquois pottery. In it, he argued for continuity of development within the region, rather than replacement of earlier populations through Iroquois in-migration. Following this publication, tracing the *in situ* development of separate Iroquois groups became an important focus for Iroquois archaeologists and Griffin encouraged his graduate student, Marian White, to pursue the historical development of Iroquoians in the Niagara Frontier. Seventeenth-century observations of the Wendat (Huron) suggested that Iroquoian horticultural villages periodically moved to a new location in response to resource depletion and other concerns. Following the work of Charles F. Wray on the Seneca site sequence (Wray and Schoff 1953), Marian became an early advocate for tracing the movement of a community through time and space. She did this first in the Niagara Frontier and later in northern New York and the Cayuga area. Her publication "Settlement Pattern Change and the Development of Horticulture in the New York-Ontario Area" explored the development of this pattern (White 1963a) and became widely cited.

Marian White's doctoral research, completed in 1958 (White 1961), built on the idea of the *in situ* development of Native people in the Niagara Frontier region of western New York. White relatively ordered Iroquoian sites in the region and believed that sequentially occupied sites in close proximity reflected the movement of a single community over time. What was unclear and remains a topic of inquiry is the ethnic identity of these communities. Neutral, Wenro, and Erie all are candidates for having occupied western New York during the first half of the seventeenth century. In her dissertation, White cautiously

referred to the sites she studied as "Niagara Frontier Iroquois," thereby avoiding ethnic labels. White then spent much of her subsequent career attempting to correlate site sequences in western New York with these three groups. While seventeenth-century cartographic evidence placed the Erie south of Lake Erie, it is not clear whether Erie occupation extended as far east as Buffalo. The location of the Wenro remains uncertain, excepting that we know they were east of the Neutral and west of the Seneca. White (1977) suggested that the Shelby site in Orleans County (identified on U.S.G.S. maps as a "Neuter Fort") might be Wenro. The Neutral were seen as largely centered in Ontario. However, the degree to which Neutral occupation extended into New York is unclear. The *Jesuit Relations* (Thwaites 21:191) stated that in 1640 there were three or four Neutral villages east of the Niagara River. In order to address the question of the eastern extent of Neutral occupation, Marian began to consider the possibility that Neutral communities moved sequentially from Ontario to New York.

Marian White had Frederick Houghton as a role model for a Buffalo-based archaeologist interested in Ontario. Frederick Houghton (1869 – 1950) was the first archaeologist to systematically consider the archaeology of the Niagara Region in both Ontario and New York, though the historian Orsamus Marshall from Buffalo had surveyed sites on both sides of the Niagara River in the 1860s (Pendergast 1992:32). Both Houghton and White were closely connected to the Buffalo Museum of Science and it is clear from White's publications that she was thoroughly familiar with Houghton's research (White 1958b). Like Houghton, White would turn her attention to the entire region, ignoring the international boundary that too often served as an artificial obstacle to understanding the archaeology of the region (White 1963).

White's (1968) reexamination of the Van Son Cemetery on the northern tip of Grand Island, New York, led her to conclude that it was occupied between 1635 and 1645. These dates suggested that it was too late to be a Wenro site, as the Wenro left their homeland in 1638 to join the Wendat. She noted similarities of this site to Ontario sites, especially the St. David's site near Stamford, Ontario. This observation led her to conclude, as Houghton (1909) had done before her, that the Van Son cemetery was Neutral. Her study of the Van Son Cemetery also led to her realization of the need for a better understanding of the Neutral occupation in the Ontario portion of the Niagara region[1].

In 1968 White searched for possible Neutral sites in Lincoln and Welland counties of Ontario and studied available collections from these sites, most of which were assembled at the turn of the twentieth century (White 1969). To a lesser extent, White also checked for possible Neutral sites in Wentworth and Haldimand counties. Her 1969 unpublished report (82 pages, now uploaded to the Digital Archaeological Record) contains four appendices: A) St. David's Artifacts; B) A. L. Benedict's 1908 report on St. David's; C) Port Colborne Artifacts; and D) Pottery from Point Abino. She published a formal report based on this research in *Ontario Archaeology* (White 1972a). In it, she postulated that two separate communities had periodically shifted their location from west to east across the Niagara River, one along the Niagara Escarpment and one along the north shore of Lake Erie. The postulated community movement along the north shore of Lake Erie was based on material from cemeteries at Port Colborne, Sherkston, and Point Abino[2]. This hypothesized movement fit with the documented presence of Neutral villages

[1] Fitzgerald (1990:331) suggests that the isolated nature of the Van Son cemetery, the presence of single (rather than multiple) burials, and the presence of an "Ave Maria" Jesuit ring are evidence for dating Van Son to a period after the Neutral dispersal (1647 – 1651). He suggests Van Son might reflect a frontier Iroquois occupation. More recent articles by Mason (2003) and Mason and Ehrhardt (2009) suggest that using ring iconography for chronological purposes is problematic. Another reanalysis of the material from Van Son in the Buffalo Museum of Science might prove useful in resolving the dating of this cemetery.

[2] Subsequent research by Martin Cooper for his doctoral dissertation (University of Toronto) revealed two precontact and three contact period villages, suggesting a sequence of village movement from east to west.

east of the Niagara River in 1640, likely facilitated by the movement of the Wenro to Wendake (Huronia) in 1638 and the southward shift of Erie villages (White 1971a, 1978).

In her dissertation research and subsequent publications, Marian White considered an extensive range of cartographic and other ethnohistoric evidence pertaining to Native peoples living in and adjacent to the Niagara region. Her interpretation of the Kleis site cemetery (c. 1625-1640) south of Buffalo (White 1967) is informed by accounts of the Huron during this same period. In this endeavour, she was assisted by her colleague Elizabeth Tooker in the SUNY Buffalo Anthropology Department during the mid-1960s (see also Tooker and White 1968). Elizabeth Tooker left Buffalo for a position at Temple University but she and Marian remained friends and both were active in the annual Conference on Iroquois Research, which often included a significant Canadian contingent -- Gordon Day, James Pendergast, Bruce Trigger, and J. V. Wright, among others.

Marian White reviewed a number of books dealing with Canadian archaeology, including *Understanding Iroquois Pottery in Ontario* (White 1958b), *The Donaldson Site* (White 1963b), *The Bennett Site* (White 1971b), and *The Ontario Iroquois Tradition* (White 1972b). White praised Norman Emerson's *Understanding Iroquois Pottery in Ontario* for the example of professional-avocational cooperation it reflected, a practice she routinely encouraged. She was less enthusiastic about his general conclusion. Bender (1992:15) has noted White's emphasis on the importance of hypothesis-testing using statistical analysis and this bias is clearly revealed in these reviews. In reviewing J. Norman Emerson's book she was critical of his intuitive approach as he did not give a clear explanation for rejecting the best arrangement of Brainerd-Robinson coefficients. She also took on J.V. Wright's conquest theory in her review of *The Bennett Site* and *The Ontario Iroquois Tradition.* In his earlier 1967 review of *The Ontario Iroquois Tradition*, William Ritchie had questioned Wright's conquest theory but then smoothed over his criticism by stating that there were more pertinent data presented in the then-unpublished Bennett site report. In the late 1960s and early 1970s the number of professional archaeologists working in the Northeast was small and it was not easy for anyone, male or female, to publicly disagree with a colleague. Marian White was not combative, but she had the guts and intellectual honesty to call things as she saw them.

In 1969 White received funding from the National Science Foundation to investigate "The Nature of Warfare and Confederacies among Northern Iroquoians." Using the concept of regular community movement of a few miles, White hypothesized that disruptions of this pattern could be an indicator of either famine or warfare. She chose to investigate village movement in two areas: northern New York (Jefferson County) and the Cayuga area. In northern New York, an area outside the original League of Five Nation Iroquois, the sequence of village movements terminated, whereas in the Cayuga area it did not. Both sequences were then to be compared against known sequences in other areas, including the Niagara Frontier. The time of the disruption of community movement in Jefferson County could then be checked against the site sequences in other areas to see if the Jefferson County disruption was specific to that region or more general. Early and late sites in any sequence were to be compared for indications of changes in the intensity of warfare or ecological setting.

White further hypothesized that the formation of a confederacy would be reflected in changes in the frequency of non-local artifacts and evidence of broader ceramic styles. As a consequence of her work in northern New York, White became keenly interested in on-going St. Lawrence Iroquoian research in adjacent Ontario, consulting with J. V. Wright, James Pendergast, and Bruce Trigger. Given the wealth of new Iroquoian data since 1969, especially in Ontario, White's approach, as applied to all of Iroquoia, retains exciting potential even today.

Action Archaeology

Bender (1992:17) notes that between 1963 and 1968 Marian White was involved in 11 salvage projects. In 1964 a bulldozer operator in Fort Erie uncovered human bone. The Department of

Anthropology at the University of Buffalo was contacted and Marian White volunteered to undertake salvage operations with a crew of her students. They worked in shifts 24 hours a day during the 10 day deadline to salvage as much data as they could (White 1966)[3]. They were assisted by members of the Houghton Chapter of the New York State Archaeological Association, some Fort Erie residents, and William Noble who served as a representative of the National Museum of Canada. All material was transferred to the National Museum of Canada.

The loss of archaeological information to archaeologists, the public, and to descendant communities was a major concern for Marian White and a motivation for her founding the Highway Salvage Program at SUNY Buffalo in 1969, hiring William Engelbrecht to run it. Engelbrecht was followed in that position by Tom King, who later rose to national prominence as an advocate for historic preservation, serving on the U.S. government's Advisory Council on Historic Preservation. Along with Bert Salwen, she was a founder of the New York Archaeological Council (the organization of professional archaeologists working in the state) and served as its first president from 1972-1974. White's 1972 call to action predicted: "at our present rate of destruction, the remainder of the Niagara Frontier's archaeological resources will be gone in a decade" (White, 1972: 4). She fought tirelessly for legislation, funding and cooperation.

Legacy

Above all, Marian White was dedicated to understanding and preserving the archaeological legacy of the Niagara Frontier region and the State of New York. Marian also did much to revitalize the journal and meetings of the New York State Archaeological Association (Brennan 1976). Both the NYSAA and NYAC remain vital organizations today.

Her professional memberships were as numerous as her archaeological activities. She was active with the American Anthropological Association, Society for American Archaeology, New York State Archaeological Association, Eastern States Archaeological Federation and the New York Archaeological Council.

White established the archaeology program within the anthropology department at SUNY Buffalo. Joseph Granger, Roger Moeller, Jack Schock, and Neal Trubowitz all were students of Marian White and received their Ph.D. from SUNY Buffalo. She was supportive of students and especially encouraged female and Native American students, two under-represented groups in archaeology in the 1960s. Many students excavated with her over the years, including Canadians Jim Chism and Bill Fox. She encouraged her students to take an active role in professional archaeological societies and frequently helped with their transportation and housing so they could attend meetings.

Her advocacy did not stop with her students, White also called for the cooperation between 'archaeologists' of all levels. At the 1956 Annual Meeting of the NYSAA, she led the group discussion "Practical Ways of Achieving Cooperation Between Professional and Non-Professional Archaeologists." Those that worked alongside White knew her constant battles against looters and pot hunters. Plagued by unofficial excavations of noted sites, Marian attempted to bridge the academic gap in support of a unified goal.

White is known for her work on numerous sites in western New York and southern Ontario. By 1986, the site file Marian White established listed over 2500 sites (Hunt 1986:324). Her quest to save sites from demolition due to "urban and industrial expansion and highway construction" (White 1958), one of her most valued efforts, drove her to continue working day and night

[3] The Orchid site has been grouped together with the Surma site and is now referred to as the Peace Bridge site, a continuous, buried multicomponent cultural deposit extending over an area of approximately 25 acres in downtown Fort Erie (Williamson and MacDonald 1997; 1998).

(Figure 4). The pace at which these sites were being studied also contributed to the absence of final published reports.

Recognition

Marian White was appointed to the New York State Historical Preservation Board by Governor Rockefeller. She was elected to the Executive Board of the American Anthropological Association but died before she could serve. She was posthumously awarded the Cornplanter Medal for Iroquois Research from the Cayuga County Historical Society for her work on the Kinzua flood control project (Fenton 1976). In recognition of her scholarly contributions, a *Festschrift* was published in her honor (Engelbrecht and Grayson 1978) that included a number of Canadian scholars: Bruce Trigger, McGill University; James Tuck, Memorial University; Jerome Cybulski, National Museum of Man; and William Noble, McMaster University.

White's efforts to preserve the material culture of the region gave rise to the aptly named Marian E. White Anthropology Research Museum. This facility on the SUNY Buffalo campus houses collections of North American archaeology, many unearthed by White herself. Formally opened to the public in 1979, the groundwork was laid decades earlier by White's attempts to establish a departmental museum.

Marian may not have completed all she set out to accomplish but she passed on her tenacity, drive, and attention to detail to those around her. Friends, family, colleagues, students, and field assistants alike benefited from working alongside such a driven archaeologist. As her colleague Frederick Gearing noted at the memorial service, "Anthropology was Marian White's vocation. More than that, it was her life. More than that, even, anthropology was her religion" (Gearing, 1976).

Acknowledgements. We are grateful to Martin Cooper for helping to update us on recent developments in Ontario archaeology and to Kathleen Ehrhardt for information on Jesuit rings.

Figure 4. *Excavations continued through the night. Marian White at the Kleis site, Hamburg, N.Y., summer 1959, Niagara Frontier Archaeological Project. Photograph courtesy of the Buffalo Museum of Science.*

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Profile

J. Norman Emerson and Frank Ridley: Ontario Archaeology As We Know It

Peter Ramsden

This joint profile addresses the careers of J. Norman Emerson and Frank Ridley, each a very significant figure in his own right in the history of Ontario archaeology. Norm Emerson was a professional academic archaeologist who taught at the University of Toronto for 30 years and conducted a number of major excavations that are still pivotal to our interpretation of Ontario's past. Frank Ridley was an avocational archaeologist who was a builder by profession. Within the constraints imposed by his job, he conducted a number of excavations and produced several prominent publications that, like Emerson's work, still serve as pillars of Ontario's archaeological history.

Despite their distinct contributions, there is justification for considering Norman Emerson and Frank Ridley together. Both were well known and widely respected Ontario archaeologists and they were essentially contemporaries through their most active years of research. Moreover, it is probably fair to say that both are best remembered for their pioneering work on the archaeology of the Huron-Wendat. In fact, they might be considered the founders of modern Huron-Wendat archaeology. I cannot, of course, ignore that it was through their writings on Huron-Wendat archaeology that they also became the two principals in what might be Ontario archaeology's most celebrated rivalry or enmity. But while some may recall that rivalry upon hearing their two names, I don't consider it to be the primary reason for remembering them together, or even the most important thing that linked them, and continues to link them.

Emerson and Ridley were both creative and imaginative scholars of Ontario archaeology. They were both passionate about social causes and, although this passion sadly drove a wedge between them, they believed that their archaeological scholarship was a valid way to advance those causes. They were, in many respects, ahead of their time and were both subjected to some degree of criticism as a result. Each of them had a broad vision of the interpretation of Ontario's past and tried to make long-range connections (some of them almost 'flights of fancy', as Emerson once described one of his own interpretations), in their quite different treatments of Ontario's ancient culture and history. Furthermore, each of them inspired and nurtured a large number of aspiring archaeologists, both professional and avocational (some still active), personally and through their writings.

Ridley and Emerson were most active from the late 1940s until the early 1970s, an era when avocational (then known as amateur) archaeologists were an indispensable element in the archaeological community. These avocationals were responsible for a great deal of the archaeological work that got done. In fact, during that time, an amicable and highly productive collaboration between the province's few professionals and the larger number of enthusiastic, dedicated and serious amateurs really put Ontario archaeology on the map, so to speak. It created the

essential framework of Ontario's archaeological past as we now know it. Norman Emerson and Frank Ridley, the professional and the 'amateur', were two of the most prominent figures in that fruitful collaboration. Indeed, they both wrote glowingly of it and worked hard over many years to try to ensure its continued success. It was Emerson who created the Ontario Archaeological Society as a way of encouraging non-professionals to be actively involved in archaeology, providing them with help and supervision within an educational framework. Frank Ridley, in turn, was one of the original founding members of the society.

Frank Ridley

Frank Ridley (Figure 1) was the older of the two, born in 1904 in England. He immigrated to Canada as a young boy and grew up in, among other places, rural Manitoba, where he became a friend and admirer of his Cree neighbours and learned much from them about living on the land. Frank became interested in archaeology as a teenager when his family lived in Milwaukee, where he attended a lecture series on archaeology at the Milwaukee Museum. As an adult he lived in Islington, a suburb of Toronto, and became successful in the building trade. That success eventually gave him both the means and the time to pursue his very lively avocation. His archaeological interest became focused in 1946 when he attended a lecture in Toronto by Kenneth Kidd on the subject of the Royal Ontario Museum's excavations at Fort Ste Marie. He was particularly struck by Kidd's statement that the archaeology of Huronia was still essentially unknown. This observation stimulated him to pursue a long-standing interest in re-locating sites of seventeenth-century Huron-Wendat villages that hosted the Jesuit mission to Huronia, which had been previously documented by A.F. Hunter. He became friends with, and an informal pupil of, Kenneth Kidd, and he undertook some investigations of Huron-Wendat village locations, both alone and in Kidd's company. In 1946, for example, together they test-excavated the large ossuary associated with the village of Ossossane, which Ridley had located, and which Kidd went on to excavate in its entirety (Kidd 1953). Ridley was also responsible for the acquisition of the Ossossane property by the province.

Figure 1: *Frank Ridley*

Ridley continued his quest to re-locate and identify seventeenth-century Jesuit mission sites in Huronia over the next several years, re-visiting the sites recorded by Andrew F. Hunter, as well as discovering new ones, often at the request of the government of Ontario and occasionally assisted by provincial government funding. In the process he uncovered evidence for a pre-contact Iroquoian occupation of Huronia, which he called the Lalonde culture. He described it as distinct in many ways from the historic Huron-Wendat material and argued that it represented a widespread, stable stage of Iroquoian development that had counterparts, or variants, throughout the Iroquoian area. The definition of the Lalonde culture (or phase, stage, phenomenon, etc., as it has been variously known) may be Ridley's best-remembered accomplishment.

Along with his work in Huronia, Ridley pursued an abiding fascination with the archaeology of northern Ontario, where he carried out surveys and excavations from Lake Nipissing

to Lake Timiskaming to Lake Abitibi to Lake Superior. In some of these locations he uncovered and reported on evidence for ancient, preceramic occupations, some of which were ultimately incorporated into Jim Wright's (1972) formulation of the Shield Archaic. In some of these occupations he occasionally and somewhat over-enthusiastically saw similarities to (then) poorly-documented Arctic and even Asian cultures. He also described later First Nations occupations of those areas. In the process, he demonstrated, on much sounder evidence, widespread ceramic style horizons throughout the Great Lakes and adjacent Subarctic. His testing of the site at Michipicoten on Lake Superior in 1955 is considered to mark the beginning of the study of the Woodland period in the Boreal forest region of Ontario (Dawson 1999:27). Ridley also sought to re-locate several northern fur-trade posts, from Lake Abitibi to Lake Superior, often in conjunction with the search for earlier sites.

But probably best-known among Ridley's northern projects is his test excavation at the Frank Bay site on the southern shore of Lake Nipissing. From 1951 to 1953 he excavated a test trench through the complex stratified deposits, revealing a history of occupation from the Archaic-period Mattawan stratum through Middle Woodland and Late Woodland, culminating in a seventeenth-century layer containing both aboriginal and European artifacts. In spite of the remoteness of the Frank Bay site from the Iroquoian area in southern Ontario, both Ridley and others (including Emerson) hailed the site as a capsule containing the complete sequence of Iroquoian ceramic development. In fact, Wright (1966) included the site as a component in all his stages of the Ontario Iroquois tradition, in spite of its location in historic Nipissing territory. But it must be pointed out, and it is to Ridley's lasting credit, that he quite unambiguously identified the seventeenth-century stratum at Frank Bay as being the village of the Nipissings depicted on Galinée's map of 1665, based on its location and date, notwithstanding its Huron-Wendat style of ceramics (Ridley 1954:40).

Ridley was always looking for connections in the material that he found and studied, and he was often quick to see possible inter-regional relationships. While some of these connections, such as the perceived similarities between far-flung lithic complexes noted above, were, in retrospect, without substance, others probably warranted more serious attention. In discussing the exterior-bossed, dentate-stamped collared pottery from the Early Iroquoian Boys site, Ridley was able to document its distribution, using published sources (as of 1958), throughout southern Ontario, New York, Michigan, Indiana, Illinois and as far afield as Kansas City, and even beyond to Lake Baikal. Although he noted that it was characteristic of the Middle Woodland Weaver and Havanna foci of the Illinois River valley, he stopped short of specifying any historical implications for the origin of Iroquoian culture in southern Ontario, referring only to 'influences'. The ceramics from the Late Woodland component at the Michipicoten site similarly indicated widespread connections. At this site he recovered not only ceramics familiar from the lower Great Lakes area, but also wares he identified as being from the Plains. Here he was willing to speculate that this evidence indicated long-range movements of different nomadic peoples through this region, resulting in diverse ceramic styles – an idea more thoroughly explored a year or two later by MacNeish (1958).

A later interest of Ridley's was the archaeology of the Neutrals of the Hamilton-Grand River area, which was sparked by seeing a display of artifacts from a site in Ancaster at Dundurn Museum. Given his experience of Huron-Wendat ceramics, Frank realized that, by contrast, very little was known about Neutral ceramics. He set about trying to rectify this gap by documenting both museum and private collections from the Neutral area, as well as doing some limited field work.

Ridley continued to be a significant figure in Ontario archaeology into the late 1970s, publishing on a wide range of topics. On behalf of the Ontario government, he re-located and documented sites of historic-period Huron-Wendat villages near his cottage in Tiny Township, contributing reports on them to the Ontario Archives.

Frank Ridley achieved international recognition in 1959 when he was invited by the

government of China to be part of a scientific delegation to that country. In 1969 he was honoured by the *Ontario Archaeological Society* when he was elected an Honorary Life Member. In 1979 he became the first recipient of the *J. Norman Emerson Silver Medal*, awarded by the OAS to "an outstanding Ontario non-professional archaeologist whose life's work has been consistently of the highest standard, who has made an exceptional contribution to the development of Ontario archaeology and who has earned acclaim for excellence and achievement". Frank Ridley died in 1985.

J. Norman Emerson

Norman Emerson (Figure 2) was born in Toronto in 1917 and obtained a BA in Sociology at the University of Toronto in 1940. His first exposure to archaeology came as an undergraduate in the summer of 1938, when he joined a University of Toronto field crew excavating at the Pound site in southwestern Ontario under the direction of the recently-hired Professor Phileo Nash (ed. note: see Nash profile, *Ontario Archaeology* 89/90). The following summer he returned to the Pound site, and that Fall he went to Algonquin Park with Kenneth Kidd of the Royal Ontario Museum. When he graduated in 1940, Emerson was committed to a career in archaeology, and changed his focus to Anthropology for an MA at U of T, which he received in 1941. By that time he had also gained two seasons of experience working for the legendary Fay Cooper Cole of the University of Chicago at the Kincaid site in Illinois. And it was to the University of Chicago that he went to begin a PhD in 1941.

Figure 2: *J. Norman Emerson (holding guitar)*

Norman's graduate work at Chicago was interrupted by a stint in the Canadian army from 1943 to 1946. Once discharged, he accepted an invitation from Professor T.F. McIlwraith to join the faculty of the Department of Anthropology at the University of Toronto – a position he would occupy for the next 30 years. At U of T, Emerson set about building a programme of archaeological research and teaching. As many readers will be aware, he turned out to be skilled at combining the two. However, army service, and his new academic responsibilities, not to mention starting a family, delayed his completing the PhD by several years. On the positive side, his position at the University of Toronto provided access to student crews and institutional support, allowing him to conduct excavations that contributed significantly to his dissertation on the archaeology of the Ontario Iroquois.

Archaeological training and teaching were Emerson's first priorities throughout his career. Along with McIlwraith and Kidd, Emerson seems to have had the uncanny ability to foresee, long before others did, the coming expansion of Canada's universities, the great boom in development in southern Ontario, and the expansion of "leisure time"– all of which, they predicted, would contribute to an increasing demand for archaeological work and teaching and a large body of people trained to do and oversee it. The Anthropology Department at the University of Toronto took as its mission the creation of that army of trained archaeologists, and Emerson was primarily responsible for implementing it. The programme started in the spring of 1947 with a student 'dig' – the first of the student 'blitz' digs – at the Aurora site, a protohistoric Huron-Wendat

site north of Toronto. This work was actually undertaken at the request of a first-year Pre-Med class who wanted hands-on experience to accompany their elective course in archaeology. The experience reinforced Emerson's conviction of the need for trained archaeological supervisors and so, immediately afterwards, he took a crew of four students to excavate the Point Peninsula Kant site in the Ottawa valley, giving them a thorough training in field methods. They all then assisted at a joint U of T - ROM field school at the Warminster site. During this excavation of Warminster, the first ever archaeological Iroquoian longhouse was excavated and recorded. Emerson continued the tradition of 'student digs' at the University of Toronto from the 1950s until the 1970s. It was his way of combining the task of teaching archaeology to the growing population of university students with the need to conduct archaeological research on meagre budgets. Among the sites he investigated in this way were: Aurora, Benson, Black Creek, Dewaele, Downsview, McKenzie, Millroy, Parsons, Reesor, Seed-Barker, Tabor Hill and Warminster. The results from the earliest of those excavations became incorporated into Emerson's PhD dissertation, which he submitted and defended in 1954.

In 1960 Emerson re-instituted the practice of teaching archaeological field schools for a limited number of students. From 1961 to 1968 he used the Warminster site, at the time the accepted location of Champlain's Cahiague, where he also frequently held large student digs in the fall. The explicit purpose of the field schools, averaging about 15 to 20 students, was not to produce future professional archaeologists – although they were an occasional by-product. It was, rather, to train people who would be able to supervise undergraduate students and members of the public on large excavations, including salvage projects, and who could, in turn, train others. In this way Emerson believed he was pre-emptively satisfying a need that would shortly materialize and continue into the foreseeable future. The crisis may have arrived a bit sooner than he expected but I think we should all be thankful for his foresight.

In addition to these partly educational excavations, Emerson carried out more research-oriented investigations, as well as some of the first salvage operations in Ontario. His excavation at the Hardrock site on Balsam Lake in 1950 and his initial testing of the nearby Benson site the following year, for example, were in pursuit of information concerning connections between the Huron-Wendat and the St. Lawrence Valley Iroquoians ('the Roebuck focus' as it was labelled then). It was also with questions about the easterly relationships of the Huron-Wendat that Emerson excavated at the Payne site in Prince Edward County in 1958. Between 1950 and 1953 Norman turned his attention to the areas of Barrie and Collingwood, where the University of Toronto became involved in excavations at the Graham-Rogers and MacMurchy sites. Emerson's interest here was the historical connections between the seventeenth-century Huron-Wendat and the Petun of the Collingwood area. When had they become separate? Did they migrate northwards towards Huronia as one people and separate only after they got there, or did they move northwards from different places and/or at different times? In pursuit of more esoteric questions Emerson conducted surveys and excavations at sites of the remote and mysterious 'Puckasaw Pits' near Marathon on Lake Superior between 1957 and 1959. He concluded, partly through a process of elimination, that the enigmatic structures were the product of vision quests carried out on a bleak and forbidding lake shore from Archaic times until the relatively recent past.

In 1956, in co-operation with the National Museum of Canada, Emerson undertook to salvage as much as possible of a large Point Peninsula cemetery and habitation site at Ault Park, near Cornwall, in advance of its destruction by the planned St. Lawrence Seaway construction. Three seasons of work were insufficient to excavate the complete site. The bulk of it was, however, investigated and a vast body of data was recovered and preserved. This mitigation project was notable as the first large-scale site rescue in Ontario, and it was the first instance of archaeologists employing big earth-moving machinery to strip large areas of topsoil to reveal sub-surface features quickly. Moreover, the Ault Park salvage was a remarkable example of participation, support and

collaboration by many diverse institutions: the National Museum of Canada (funding, equipment, administration and personnel); the University of Toronto (equipment, administration and personnel); Queen's University (personnel); McGill University (personnel); the Royal Ontario Museum (personnel); the Ontario Archaeological Society (personnel); the Quebec Archaeological Association (personnel); the Hydro-Electric Power Commission (equipment and personnel); the Ontario Department of Lands and Forests (equipment); and the Ontario Department of Education (funding). About the time that he was wrapping up the Ault Park dig in 1958, Emerson and Jim Anderson were called to salvage what they could of the Bosomworth cemetery near Bradford, which had been disturbed by a quarrying operation. In 1965, with the assistance of Bill Noble, he undertook salvage of a Late Archaic/Early Woodland cemetery that was threatened by parking lot construction in Fort Erie. And again, close to the end of his career, he oversaw the salvage of a disturbed cemetery at Holland Landing on the Holland River.

Along with his love of teaching, Norman was known for his enthusiasm for engaging the public. His most lasting legacy in this regard is almost undoubtedly the formation of the *Ontario Archaeological Society.* The Society grew from a group of enthusiastic students that Norm taught in an 'extension' course in 1950 who were eager for more active experience in archaeology. The newly formed society got its hands dirty almost immediately: more than 30 members participated the following summer in excavating at the Benson site near Balsam Lake. The Society was legally incorporated a few years later with a founding group of directors that included Frank Ridley. There is no need to recount, here, the tremendous amount of work the Society and its members did during the 1950s and 1960s. Much of it was inspired by Emerson's own research into Huron-Wendat history. The OAS was always near to Norm's heart, as I know personally from many chats with him about it during the early 1970s, and he still inspires it nearly 40 years after his death, as a glance at the Home page of the OAS web site will show.

In the early 1970s Emerson's interests grew to encompass the field of intuitive, or psychic, archaeology. While many of Norm's colleagues were understandably skeptical of this approach, he became a passionate advocate of it, and maintained to the end that, while belief played a role for some practitioners, it was possible to pursue it with a scientific detachment and to demonstrate its effectiveness. It is regrettable that his ill health and early death prevented him from pursuing it further and denied him the chance to more fully explain and demonstrate it to the Canadian archaeological community.

Norman Emerson's many achievements were recognized in 1978 by the Canadian Archaeological Association (which he had helped found in 1968), which awarded him the first *Smith-Wintemberg Award*, given "to honour professional members of the Canadian archaeological community who have made an outstanding contribution to the advancement of the discipline of archaeology and our knowledge of the archaeological past of Canada". Norman died later that year.

The Emerson-Ridley Legacy

It is difficult to sum up the legacy of Norman Emerson and Frank Ridley succinctly – they were both so energetic, their interests so eclectic, and their visions so far-reaching. And it is easy, from this point in time, to underestimate the ways they changed, or created, our approach to archaeology and the interpretation of the past in Ontario, particularly the Iroquoian past. So much about their work has just become common practice and understanding, and we can't remember when it wasn't that way.

When Ridley and Emerson began working on Ontario Iroquoian archaeology in the 1940s systematic approaches to field work were still in a rudimentary state. There were virtually no historical or taxonomic schemes for organizing the prehistory of Ontario. The few reports that had been produced were generally static and object-oriented. There were virtually no sustainable theories about origins, migrations or cultural development. Ridley and Emerson both felt this lack deeply, and worked to change it. Emerson

learned the Chicago System of excavation and field-recording at Kincaid, employed it on his own excavations, and taught it to his student and public crew members. It forms, essentially, the foundation of the system most people still use. Ridley learned his field techniques from the very methodical Kenneth Kidd, and he employed and adapted them when, for example, he peeled away the complex levels and layers at the Frank Bay site. He, in turn, passed on his learning and his own innovations to assistants and students.

Emerson tackled what he perceived to be Ontario's theoretical vacuum in his PhD dissertation by employing the then-popular Midwestern Taxonomic (or McKern) System to organize known Iroquoian sites and newly emerging data into an Iroquoian Pattern with constituent foci, such as Middleport and Roebuck. He also employed the concepts of tradition and horizon to denote, respectively, long-term continuity among sites in a given region, and what he perceived to be the widespread stylistic influence of one site or group of sites over a large area. It was with a similar interest in introducing more orderly time-space systematics into the picture of Ontario Iroquoian cultural development that Ridley proposed the Lalonde Culture, and argued for an earlier widespread Glen Meyer/Barrie/Uren cultural stage across southern Ontario. While all of this may seem simplistic now, it was remarkably innovative at the time. Those basic constructs still survive in one form or another, even if largely for convenience of reference. Of course, Emerson and Ridley's slightly differing views led to a famous war of words in print, but two things should be noted. First, those public disagreements reflect the passion and enthusiasm they both brought to their work and the importance they attached to it. Second, the articles that resulted from their disagreements, from the 1950s until the early 1960s, laid out the basic framework of Ontario Iroquoian archaeological history from which subsequent researchers have taken their lead.

Both men were ahead of their time in some of their approaches to interpretation and, as often happens in such cases, other archaeologists paid little attention. As one example, Ridley and Emerson were both adamant that ethnohistorical records, as well as historic period tribal and territorial labels, could not and should not be relied on in the interpretation of pre-European-contact archaeological materials. They both explicitly wrote that, just because an archaeological site is in an area that was occupied in historic times by a particular First Nation group, we cannot infer from that fact alone that the site is connected to that group. In his PhD dissertation, Emerson went so far as to say that attempts to make such connections impeded the interpretation of Ontario Iroquoian history and cultural development. Ridley outlined a rigorous set of criteria by which a site could reasonably be said to belong to a particular 'ethnic' or 'tribal' group, but he was adamant that sites in the same area not meeting those criteria could not be so identified. Emerson also anticipated recent debates in pointing out that some sites identified as Huron-Wendat might actually have been occupied by their Nipissing or Mississauga neighbours, given the close interaction between the Huron-Wendat and the latter two groups, and that they were archaeologically indistinguishable. In a similar vein, Emerson was sceptical of using ethnohistorical records to supply details to pre-contact archaeological interpretations. Hardly anybody recognized these insights at the time, or later. Ontario archaeologists continued to label sites with historic period identities and to presume that details of elaborate social constructs from the historical records could be imposed on the archaeological data based on broad material culture similarities.

The impact of Ridley and Emerson on Ontario archaeology also had a practical dimension. They both strongly believed that an appreciation of the past was essential for the education of individuals and for society as a whole – meaning that the public and society had to be involved in archaeology. Both men had an active interest in preserving historical sites and developing them for educational and tourism purposes. This interest is, in part, what motivated Ridley, for example, to re-locate the remains of fur-trade sites, sometimes astutely aware of the likely routing of future highways. It is what moved Emerson to create the OAS and to encourage public participation in his own and other excavations.

Both men believed that government and social institutions had a responsibility to support archaeology and to promote the public's interest and participation in it. It was not simply opportunism that prompted them both to seek logistical support, equipment, personnel, funds, etc., from federal and provincial government departments, the military, the Boy Scouts, Ontario Hydro, and so on. Of course, all that support helped them to do their work in a time when budgets for archaeology were meagre. But in seeking and accepting it they were giving reality to their conviction that archaeology was a public responsibility with social and economic value and not just an esoteric, ivory-tower predilection. I cannot end, however, without mentioning that both Ridley and Emerson also poured a huge amount of their own time, money and resources, as well as those of their families, into practicing and promoting archaeology in Ontario.

For many years, Norman Emerson and Frank Ridley were the names and faces of Ontario archaeology that people outside the field knew. They carried out important pioneering, modern work throughout the province -- Ridley perhaps most notably in northern Ontario and Huronia; Emerson in south-central and eastern Ontario. Particularly in the field of Ontario Iroquoian studies, they laid the foundations of the methods, approaches and interpretations that are familiar to us all, and which we more-or-less take for granted.

Afterword. Rather than provide a citation for each detail throughout the profile, except where I deemed it necessary to support a point, I have listed the sources I consulted, apart from their own writings, at the end of the References Cited. I knew Emerson for nearly twenty years, as my teacher, mentor, friend and colleague, whereas I barely knew Ridley at all. Unavoidably, therefore, the degree of insight I have into them and their work is not comparable. Furthermore, I have knowingly omitted much about both of them since I was asked to make this a joint profile rather than two independent profiles. I have chosen to emphasize the aspects of Emerson's and Ridley's careers that, for me, contribute to an appreciation not only of their respective individual achievements, but also of their joint legacy.

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J. Norman Emerson and Frank Ridley

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Book Review

Contact in the 16th Century: Networks among Fishers, Foragers and Farmers

(edited by Brad Loewen and Claude Chapdelaine)

Contact in the 16th Century: Networks among Fishers, Foragers and Farmers, edited by Brad Loewen and Claude Chapdelaine. xix + 295 pages, 98 figures, 35 tables, bibliographic references. 2016. Mercury Series Archaeology Paper 176. Canadian Museum of History and University of Ottawa Press, Ottawa. $69.95 (paper) $54.99 (PDF e-book) ISBN 978-0-7766-2360-3.

This volume is the product of a conference session organized by the editors at the 2014 meeting of the Society for Historical Archaeology, held in Quebec City. The location of that meeting provided an appropriate backdrop for the subject of this volume: exploring the vital networks of interaction which characterized the sixteenth-century Northeast. The case studies presented span the coast of Labrador to Lake Erie, with a pronounced focus on the St. Lawrence River and its estuary.

While the focus of the volume is clearly on the sixteenth century, the editors emphasize their desire to bridge the archaeological and historical records and the ways that "place has a durable emphasis over *time* and *culture*" (p. 1, emphasis in original). To that end, many of the contributors to the volume explore temporal patterns from the fifteenth through eighteenth centuries that contextualized the focal early contact networks. Many papers are concerned with the origins and distribution of European-derived goods and material correlates for Indigenous interaction networks, emphasizing the materiality of cultural interactions. Those papers not strictly focused on descriptions of trade goods provide detailed and thoughtful considerations of the archaeological and documentary records. The resulting narratives emphasize the variability of relationships between diverse Indigenous and European groups that move well beyond the Native–European dichotomy in their approach to the complexity of human experiences during this pivotal period in world history.

The book is divided into three sections, beginning with Interactions, which is focused on the Gulf of St. Lawrence. Rankin and Crompton (Chapter 1) explore the most easterly case study: the crossroads of cultures in southern Labrador and the Strait of Belle Isle between the sixteenth and eighteenth centuries. Seasonally mobile Inuit, Innu, Basque, and French came to this area to harvest resources and trade, making for a compelling study of intercultural interaction in the absence of enduring settlements. Rankin and Crompton present a narrative of increasingly formalized encounters between Inuit and European fishers and whalers, resulting in a shift from heterogeneous, European-derived assemblages to a narrower range of selected material on Inuit sites. The volatility of relations sometimes resulted in conflict and at all times was unpredictable.

In Chapter 2, Sergio Escribano-Ruiz and Saraí Barreiro Argüelles describe the variety of Basque pottery types identified at Red Bay, Labrador, and other sites dating to the sixteenth

and early seventeenth centuries on the north shore of the Gulf of St. Lawrence and the Gaspé coast of Chaleur Bay. They describe a range of recent studies that suggest that Basque wares previously thought to have been produced in France in fact originated in Spain, and they suggest that the north shore of the Gulf of St. Lawrence resembled a "Spanish Quarter of New France" (p. 50) during the sixteenth and seventeenth centuries.

Brad Loewen contributes two chapters to the volume. The first, Chapter 3, is a thoughtful consideration of the relationship between Basque and St. Lawrence Iroquoian populations based primarily on historical records. Loewen's analysis spans both sides of the Atlantic and deftly navigates geopolitical machinations in both regions. One of his central theses is that St. Lawrence Iroquoians, specifically those of the Stadaconan province, formed a "privileged partnership" with Basque fishers and traders. He suggests that jealousy over trade routes and differing relations among various Indigenous groups and French and Basque traders led to the dispersal of the Hochelagans, perhaps by the Huron-Wendat, between 1559 and 1580, and the dispersal of the Canadians/Stadaconans soon after. Chapter 4, by Vincent Delmas, catalogues beads thought to date to the sixteenth century (defined as Kenyon and Kenyon's glass bead period [GBP] 1) and describes their archaeological contexts in the Strait of Belle Isle, in the St. Lawrence River valley and estuary, and in burial assemblages on the Atlantic coast. This data-rich, descriptive article compares those assemblages with beads recovered from a 1583 shipwreck in Croatia. While the paper provides an excellent description of the bead assemblages, as Delmas notes, it does not necessarily resolve questions about the directionality of bead movement, although it is unlikely that there was a flow of beads from sixteenth-century Basque sites to Ontario (p. 86).

The book's second section is devoted to Fluvial Networks. Chapter 5, by Michel Plourde, focuses on St. Lawrence Iroquoians, Algonquians, and Europeans in the St. Lawrence estuary. Minimal beaver, copper, and sixteenth-century glass beads in assemblages suggest that there was no fur trade on the part of Iroquoians in the area prior to the seventeenth century. Plourde suggests that the mouth of the Saguenay and adjacent seal-hunting territories were abandoned by the 1580s, when Basque trading began in earnest, and that between c. 1580 and 1600 exchange continued to be limited. Withdrawal of Iroquoian groups from the estuary may have permitted greater penetration upstream by Europeans. Plourde advocates for more research into the relationships among St. Lawrence Iroquoians, Algonquians, and other Indigenous groups who frequented the St. Lawrence estuary in the late sixteenth and early seventeenth centuries, in order to understand the nature and motivations for contact-era population movements.

As was the case for that of his co-editor, Claude Chapdelaine's paper (Chapter 6) provides a thorough overview of St. Lawrence Iroquoian interactions with European and Indigenous groups, this time focusing on archaeological data from the western portion of the valley. Chapdelaine provides a detailed accounting for St. Lawrence Iroquoian sites in this region, their material culture, and the presence or absence of European goods. He argues that the "social dissolution" of St. Lawrence Iroquoians took place in multiple phases, beginning with the upstream groups and proceeding downriver, with small, seasonally occupied sites in the east providing the most promising recent evidence for discussing contact and trade among Europeans and St. Lawrence Iroquoians. Chapdelaine also takes up the problem of chronology, noting that many temporal "benchmarks" are based on historical rather than archaeological evidence, and citing the need for more radiocarbon dates and rectification of ceramic and independent chronologies.

Together, Chapters 7 and 8 do much to fill in and extend northward the "gap" in knowledge about groups living and operating between the Great Lakes and the valley of the St. Lawrence River. In Chapter 7, Jean-François Moreau, François Guindon, and Érik Langevin explore the hypothesis of a northern route between the Saguenay and Georgian Bay of Lake Huron. They build upon previous reconstructions of a northern route based on ethnohistorical documents by incorporating new historical evidence as well as

abundant archaeological evidence for such a route or, more accurately, routes. While the ceramic evidence suggests that these routes were open as early as c. A.D. 1500, the flow of glass beads is predominantly restricted to the post-1600 period. The authors' evidence suggests that relations between Iroquoian and Algonquian peoples operating in this region were both stable and amicable, possibly rooted in durable commercial relations and gift giving.

William Fox and Jean-Luc Pilon present evidence for exchange along the Ottawa and upper St. Lawrence rivers in Chapter 8. Their discussion focusses on evidence for early European contact on Iroquoian and Algonquian sites. They employ archaeological and cartographic data to reconstruct the homelands of various ethno-linguistic groups and seventeenth- and nineteenth-century trade routes as a proxy for routes that may have been travelled in the sixteenth century. In their discussion, they note the abundance of Wendat-style ceramics on Algonquian sites in the study area, as well as the lack of St. Lawrence Iroquoian–style materials. At the same time, they suggest that some St. Lawrence Iroquoians in diaspora may have been amalgamated into southerly Algonquian bands.

The third section of the volume focuses on the Lower Great Lakes. In Chapter 9, Peter Ramsden discusses evidence for interaction between people in the St. Lawrence River valley and Huron-Wendat and Algonquians in the upper Trent River valley. Ramsden explores inter- and intra-community variation in the distribution of distinctive artifacts—including St. Lawrence Iroquoian–style ceramics and pipe fragments, as well as European metals—on a group of sites thought to date to c. A.D. 1570–1600. While the data suggest a substantial influx of St. Lawrence Iroquoian populations into the Balsam Lake area, the uneven distribution of St. Lawrence Iroquoian and European artifact types suggests that links to the St. Lawrence River valley were through individual trading partnerships; that they likely differed among households and sub-community groups; and that access to, and acceptance of, these relationships were variable and perhaps volatile.

Ronald Williamson, Meghan Burchell, William Fox, and Sarah Grant present data on exchange networks between the St. Lawrence River valley and the north-west shore of Lake Ontario in Chapter 10. They argue that, in the sixteenth century, European-derived items followed the same corridor along which native copper, marine shell, and steatite flowed in the fifteenth century. To support their argument, they provide data from compositional analysis of steatite and isotopic and visual characterization of shell. Their results suggest that a trickle of goods flowed from the St. Lawrence into north shore communities, at least until that corridor was closed in the mid-sixteenth century.

In Chapter 11, Martin Cooper reviews evidence for Attawandaron trade. He describes the possible Indigenous networks through which goods may have flowed to various clusters of Attawandaron villages, highlighting their place at the centre of north–south and east–west interaction. Cooper also reviews evidence for fifteenth- through seventeenth-century trade on a site-by-site basis. Given the relative dearth of recent scholarship on the Attawandaron compared with groups farther east, this chapter provides an important update on Attawandaron archaeology.

Chapter 12, the second by Loewen, reviews new evidence, much of it from this volume, for the distribution and origins of sixteenth-century beads in the Northeast. The original reference collections for sixteenth-century beads consisted principally of assemblages recovered from Iroquoian burials in Ontario and New York. Loewen assembles and presents a new inventory of beads, including those recovered from the Atlantic Provinces, Quebec, and Maine. He identifies two or more distinct networks of French and Basque suppliers and adopters, with differing timeframes. He also suggests that the origins of sixteenth-century Spanish beads are unclear, and points to their potential origins via southern networks. Loewen's dataset and interpretations are game-changers for those who would use bead distributions to infer either chronology or interaction networks based on beads alone.

To summarize what I believe are the key contributions of the volume: Many of the authors stress the variability and unpredictability of

political and trade relationships between heterogeneous Indigenous communities; ensembles of European fishers, whalers, and colonizers; and individual traders from both groups. This is an important insight for understanding the complex realities of early contact. However, as noted by Loewen in Chapter 12, many of the chronological referents employed, particularly glass bead periods, rely on less site-specific data than are available today and on a set of normative assumptions about the flow and distribution of trade goods. This volume provides ample food for thought concerning revisiting local and regional chronologies and theorizing about the processes of cultural entanglement and "Middle Grounds" (see Chapter1) of the sixteenth-century Northeast. Loewen and Chapdelaine have brought together a collection of papers that make a major contribution to scholarship in a cohesive and well-produced volume. The rich data sets and persuasive interpretations presented are important references for scholars interested in issues of culture contact, trade, and exchange, and the history of the northeastern woodlands, eastern Subarctic, and points of origin for the European goods and peoples who frequented eastern Canada. As a whole, this volume is an invaluable resource for those who would seek to understand the sixteenth-century Northeast and beyond in all of its extraordinary complexity.

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Book Review

Mailhot-Curran: Un Village Iroquoien du XVIe Siècle

(edited by Claude Chapdelaine)

Mailhot-Curran: Un Village Iroquoien du XVIe Siecle, edited by Claude Chapdelaine. xii + 412 pages, 110 figures, 82 tables, bibliographic references, DVD. 2015. Paléo-Québec 35. Recherches amérindiennes au Québec, Montreal. $23.00 (paper) $15.00 (PDF e-book) ISBN 978-2-920366-41-1.

This edited monograph presents the multidisciplinary work done on the site of Mailhot-Curran, part of a cluster of St. Lawrence Iroquoian sites in the Saint-Anicet region of Quebec. One of the introductory chapters contains a substantial overview of the state of knowledge around the St. Lawrence Iroquoians, including of site clusters and origins, so in this sense the volume is much more than the site report that might be suggested by the title. Some of the chapters also have some lessons for best practices that are of relevance outside this particular type of site and time period.

Although this volume discusses some of the 1995–2001 work by Michel Gagné, the volume is mostly focussed on the 2012–2014 work led by Chapdelaine and Corbeil, which constituted the thirty-fourth, thirty-fifth, and thirty-sixth seasons of the Université de Montréal field school (previously held at two other locations). Chapdelaine notes in the introductory and concluding chapters that it is the first publication on an Iroquoian site in Quebec since 1989, and it is the first of a planned series of three volumes on three of the "Saint-Anicet cluster" sites (Mailhot-Curran, Droulers/Tsiionhiakwatha, and McDonald), to be followed up with a synthesis publication in 2018.

The work was published very soon after the conclusion of the excavations. The advantages would be that the detail was still fresh in the researchers' minds, the various stakeholders remained engaged, the references are up to date, and a number of masters students were able to get a publication out of it promptly enough to really help their research careers.

Given the series it is published in, the volume is clearly aimed at an academic audience. It is, nevertheless, very readable, and the technical detail will be understandable for archaeologists who are not experts in the various specialist analyses. The introductory chapter will be understandable for non-archaeologists as well, which I think is important because it lays out in detail how this project came about, and it explicitly justifies, on the one hand, why it was decided to excavate part of this site, even though it was not threatened, and, on the other hand, why an estimated 90% has been left unexcavated. The team set specific research questions, and once these had been answered, they left the site alone.

The team excavating the site were very obviously open to collaboration—indeed they have actively sought it out, with teaching staff at UM (in archaeology and other departments), with graduate students, and with researchers at other universities. This includes researchers outside of but affiliated with a university, namely, Courtemanche and St-Germain, of Ostéothèque de Montréal. Most of these collaborations were

integrated from the start, but a few were fortuitous. As Chapdelaine writes, archaeology is team work.

As Chapdelaine also notes, a field school is driven by research questions, but at same time it has to meet pedagogical aspects. Readers can get their own insights into this process by means of the field school reports, which are included on the DVD that accompanies the book. Photos and maps of the settlement patterns and features, as well as the databases generated by the various specialist analyses, are also included on this DVD.

Two of the fundamental questions the team hope to be able to answer are: Are there biological and/or cultural links among the people living in the three villages? How did they deal with their geographic proximity? Beyond that, they hope to explain the origins of this group of sites and their role in the larger history of the St. Lawrence Iroquoians.

The excavators also spent time investigating the setting of the site in its natural landscape, coming up with several scenarios for why the site is located relatively far away from the nearest watercourse.

At level of the site, the emphasis is on the level of the longhouse and trying to understand community/social fabric. For two of the seasons, geophysical survey was done ahead of time to help locate a total of three of the six longhouses located so far. An improved understanding of the village layout, "ce que nous appelons notre intuition archeologique" [tr. what we call our archaeological intuition] (p. 16) allowed them to locate the final two. The excavations targeted the houses and middens, for a total of 462 m^2, estimated to be less than 10% of the site area.

Within longhouses, the aim was to elucidate hearths/general domestic layout and outlines. No postholes are visible in this rocky soil, so the team used analogy with Iroquoian houses elsewhere and the distribution of the artifacts in the interior to figure out domestic organization, the bench lines, and the living floor. The other aim was to get dating evidence via radiocarbon dates on carbonized maize kernels. Part-way through the project, thermoluminescence analysis on ceramics was added.

I think other readers, too, will appreciate the thorough, in-depth, and innovative approaches in each of the individual chapters. Some examples:

The geophysical prospecting that helped establish the settlement patterns was funded through grants to Sustainable Archaeology and ended up providing a lesson in best practices. The discussion by Jean-François Millaire, Edward Eastaugh, and Lisa Hodgetts of the cost effectiveness, accuracy, and destructiveness of site delineation in a woodlot, based on 50 × 50 cm test pits at 5 m intervals, versus their two non-destructive magnetic survey methods, has since been published elsewhere in English as well (Hodgetts et al. 2016).

Christian Gates St-Pierre and Marie-Ève Boisvert's chapter on the worked bone industry incorporates the material from the Gagné excavations and the UM field school. The authors note that the proportion of manufacturing waste to finished items is much higher for the UM material, partly because the UM excavations used smaller mesh sizes, but mainly because the UM samples were triaged into worked and non-worked by a worked bone industry specialist in the lab, rather than by the field crew in the field. The authors argue that bone working waste can go unrecognized by even the most meticulous and experienced among the field crew. Their chapter presents a lesson in best practices if the aim is to reconstruct how bone tools were made.

The chapter on animal exploitation, by Claire St-Germain and Michelle Courtemanche, is very much written with taphonomic and other biases in mind (including presenting the proportion of fish identified below class without the scales, as these can distort the numbers) – although the three body portion tables (for yellow perch, beaver, and white-tailed deer) would have been more intuitive if the number of remains had been related to the number expected (for example, using MNE or MAU). The authors highlight the imbalance in the number of vertebrae vs. cranial bones for Atlantic salmon; a photo showing both archaeological and recent vertebrae and cranial bones effectively illustrates their statement that the cranial bones are more fragile.

The chapter on the plant macroremains recovered from the site presents master's research by Stéphanie Trottier. By plotting spatial distribution and investigating taphonomy, she was able to hypothesize, among other things, which concentrations of carbonized plant remains may represent human excrement, rather than unconsumed foods. This chapter is a compelling example of how the analysis of carbonized plant macroremains can be used to elucidate the use of space within a village.

I have a few minor grumbles with the visual presentation of the volume: the photos of the rim sherds are reproduced at much less than 100%, so it is not always possible to see details of the decorations. However, photos of each of the 262 collared rim sherds are provided on the DVD. Some of the maps showing the number of remains per square or the results of the magnetic survey are hard to follow in the paper version, but, again, there is a colour version on the DVD. I imagine that the cost of the book would have been considerably higher had it been printed in full colour, but the black-and-white reproductions are limiting, sometimes necessitating a switch to the full-colour versions on the DVD to understand what's going on. A full-colour PDF of the entire volume is also included on the DVD that comes with the paperback version of the book. It is also possible to purchase only the PDF.

What I really liked about this volume is that the introductory and concluding chapters by Chapdelaine are so explicit about how and why we do archaeology. For example, Chapter 2 explains for non-archaeologists how archaeologists decide something is "Iroquoian." Chapdelaine later expands on this, explaining that ceramics and geographical proximity are one aspect, but that sites could differ in various aspects of technology, economy, and ideology, and that this means we are looking for diversity within relative unity (p. 57). In the concluding chapter, Chapdelaine is explicit that analysts can never claim to be perfectly impartial, despite their wish to be neutral and let the facts speak for themselves, noting that there is always something that conditions their arguments to different degrees, consciously or unconsciously (p. 356).

One thing that I felt to be missing from the volume is a discussion of Aboriginal engagement in relation to this particular site – although the acknowledgments do mention the interpretive centre at Droulers/Tsiionhiakwatha (the location of the UM field school in 2010 and 2011), whose board of directors includes members of the Mohawk community at Akwesasne.

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Book Review

Before Ontario: The Archaeology of a Province

(edited by Marit K. Munson and Susan M. Jamieson)

Before Ontario: The Archaeology of a Province, edited by Marit K. Munson and Susan M. Jamieson. xvii + 242 pages, 108 figures, 18 sidebars, bibliographic references, index. McGill-Queen's University Press, Montréal and Kingston. 2013. $110.00 (cloth) ISBN-978-0-7735-4207-5. $39.95 (paper) ISBN-978-0-7735-4208-2.

Few people realize how difficult it is to organize a reader like this book, with a large number of authors covering the archaeology of an entire province. To find a tone and the right level of description and interpretation can be as hard as it is to organize the content in order to represent knowledge acquired over the last 25 years. The previous effort by archaeologists was limited to southern Ontario and covered the pre-contact period to A.D. 1650 (Ellis and Ferris 1990). This book has big shoes to fill by summarizing the past 13,000 years and by including northern Ontario. It also gives space to the First Nations' view of the past and looks at future perspectives.

As archaeologists, we must applaud and encourage this type of publication, which is not a popularized effort. The authors in this book provide the basic context of discovery, bring nuance to the specialized terminology, and avoid simplification that does not serve well the original data and the efforts of practicing archaeologists. This book is a true scientific labour, but with the means to make the results of this labour more appealing, such as the use of colour plates, sidebars, and modern references and analogies. One example used by many authors is to refer to the size of soccer fields to illustrate the size of sites or longhouses. As an unabashed Montreal Canadiens fan, I wonder if this analogy reflects the disgrace of the Toronto Maple Leafs, since the authors do not use as a reference the size of a hockey rink – or even the dimension of a Canadian football field. The use of the soccer field is probably subconscious, illustrating the globalisation of the archaeological discipline in Ontario.

Returning to the content, this book challenges the reader to make some efforts in order to understand the rich history or palaeohistory of the Aboriginal people of Ontario. Reflecting on the available data, it is no surprise that Iroquoian studies are well represented in this publication. Being an Iroquoianist myself, I cannot complain, but it is of some concern that so little space is dedicated to the Palaeo-Indian era and the Archaic period. It is probably the lack of new research on the Archaic that is responsible for its shallow treatment, although a very recent discovery of subterranean houses at the Davidson site, near Parkhill, is highly interesting. This discovery argues against the traditional impression that nothing happened during the 6,000 to 7,000 years of the Archaic period, that adaptation was very stable and that nothing changed within this vast territory. This brief chapter, well written and synthetic, tells us that the earliest inhabitants of Ontario were mobile, that they had developed rituals, and that much can still be learned about them.

The book is divided in three sections. Section I comprises five chapters summarizing the whole 13,000 years of history of the province, while

section II is thematic and sheds light on some specific aspects. Section III is a single chapter on an Aboriginal perspective, written by Kris Nahrgang, an elected chief of the Kawartha Nishnawbe First Nation.

The nine thematic chapters reveal some issues that are stimulating for archaeologists and that can be of interest for everybody. Topics such as dwellings, animals, plants, the use of stone and metal, clay pots and smoking pipes, the living landscape, social organisation, health and disease, death and burials, are basic aspects that should stimulate an interest in archaeology. Hopefully, after reading this book, no reader will question the relevance of archaeological research, and that there is something to be learned from the past. These thematic chapters, each with its own tone and approach, are definitely written to make archaeological data lively and accessible.

Among the strengths of this volume, I must emphasize the high quality of the colour illustrations, the usefulness of the figures and maps, the index, and the references, the latter being very useful for researchers and others who want to nourish their interest with complementary readings. Being so well done in its presentation, this book should not be considered a coffee table accessory but instead a new type of publication that will encourage curiosity about our past.

There is no basic flaw with this volume. It is easy to complain about some interpretations, but we all know that data come first and that explanations will always be fertile ground for debate. Nobody owns the truth, and challenging ideas and hypotheses are part of a healthy discipline. Nevertheless, I want to underline two elements that I consider constructive for dialogue among scholars. First, many chapters refer to the very unique site of Serpent Mounds. I truly believe that this site, and others of the same stature, should be targeted in a book on amazing sites that generate significant knowledge and ideas about the past. Second, social archaeology is making progress, although it is slow and in need of more detailed data, but one aspect of our archaeological practice is its multidisciplinary approach. In this regard, it is worth mentioning the hypothesis proposed by Jamieson that maize was obtained at an early stage as a feast food to cement social ties and that feasting was a major factor contributing to the adoption of agriculture by Iroquoians. A diachronic approach is needed to test this thought-provoking idea, and many disciplines will be called upon to document the growing importance of cultigens in the diet over a period of at least 500 to 700 years.

A lesson that can be learned by archaeologists while reading this book concerns the different approaches used to make stories more interesting. Neal Ferris uses the archaeologist as a guide to present the settlement pattern of an Iroquoian village. Other writers use analogies, provide definition of various concepts and take time to explain how archaeologists piece together elements to make sense of some data and propose a plausible explanation. This publication is a very good model for archaeologists who are in need of inspiration to produce a publication aimed at a broader public.

We have to remember that a book is not an end in itself. It is a step, a moment in time, and it could be the beginning of a personal research trajectory by a professional archaeologist, a student, or a layperson. This is why I applaud the fairly good bibliography at the end. Too often, books intended for a general public using colour plates and paintings to reconstruct scenes of the past lack a sufficient number of references, with the publisher using the pretext that the book is already too big. *Before Ontario* is thus a book for everyone, and I think that it is also very useful for the archaeological community. It is not the book to learn about all the mysteries of the 13,000-year past of the province of Ontario. Such a goal could not be attained in a single book, considering the richness and quantity of data to process. And if that book was to be published, it would certainly be on an electronic platform.

It has been difficult for me to review this book because I had the feeling that it had been written for non-archaeologists. Had I chosen to criticize the book, it might have sent an incorrect signal that I am somehow against this type of publication. On the contrary, I genuinely approve of this type of publication, although I am convinced that more scientific publications are

also needed so that everybody will benefit, as more data become available to write compelling stories about the past.

My last comment concerns the Aboriginal perspective written by a First Nations chief. I would like to say that it is the right time and right place for this concluding chapter, with a very sound sidebar written by Scott Hamilton on the northern Ontario context that brings together developers; Natives communities and their rights; and, in the middle, the archaeologists, who can contribute to many issues. Dialogue is part of a broad solution, and archaeologists should be aware that while trying to do archaeology, they are part of a highly complex political situation. Respect is also a major concern mentioned by Chief Nahrgang, and I do believe that archaeologists are making substantial progress in the right direction. To conclude on the controversial topic of burials, I would add that while discussing this issue in my classroom, I use a simple analogy to illustrate the rights of First Nations to limit access to burials: would you want archaeologists to excavate your grandmother's grave? The answer is always clear: No way!

This book is a welcome addition to the library of all who are interested in the past. I hope it is attractive to the general public and that many chapters will be recommended in university classrooms. Even if this book tries to cover a long history of 13,000 years, it also leaves much leeway for other publications to pursue the goal of bringing archaeology and its compelling stories to a broader audience. I hope that the editors, Marit Munson and Susan Jamieson, will continue their good work and inspire others.

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Book Review

Late Pleistocene Archaeology and Ecology in the Far Northeast

(edited by Claude Chapdelaine)

Late Pleistocene Archaeology and Ecology in the Far Northeast, edited by Claude Chapdelaine. xvi + 247 pages, 119 figures, 24 tables, bibliographic references, index. 2012. Peopling of the Americas Publications. Texas A&M University Press, College Station, Texas. $68.00 US (hardcover) ISBN 978-1-60344-790-4.

Published almost five years ago, as part of the Peopling of the Americas Publications series, this handsome volume derives primarily from papers presented at the 2009 annual meeting of the Quebec archaeological association, the Association des Archéologues du Québec (AAQ). Chris Ellis's foreword provides an excellent overview of the volume; in it, he notes the current and future importance of Indigenous community involvement and the publication of "grey literature." He also notes that, despite many advances in our understanding of these pioneering populations, we are still faced with a relative paucity of faunal evidence and solid contextual radiocarbon dates. As suggested by editor Claude Chapdelaine, the AAQ meeting session showcased the first documented early Palaeo-Indian site from the province of Quebec; however, the volume provides so much more.

In their introduction, titled "Toward the Consolidation of a Cultural and Environmental Framework," collaborators Chapdelaine and Boisvert state that "The incentive of this book is to present new data and updates of some earlier interpretations." This is done by organizing the contributed papers into two sections. The first presents the latest updates of regional syntheses from the Hudson River valley east to Maine, while the second entails a series of "specialized studies," including two chapters concerning the Cliche-Rancourt site in southeastern Quebec. Brief summaries are provided for the succeeding 10 chapters, as the authors propose that "this book should be helpful for at least a decade or more."

Jonathan Lothrop and James Bradley lead off the first section, with a review and update concerning Palaeo-Indian occupations of the Hudson River valley, which builds on the previous work of New York State archaeologists William Ritchie and Robert Funk. Late Pleistocene landscapes in eastern New York are considered in terms of general physiography; then a more detailed review of "deglacial" events; and, finally, a palaeoenvironmental reconstruction, including faunal distributions. Regional toolstone sources are also identified in this section of the chapter. Subsequent sections present often detailed data concerning the timing and routes of colonization; specific fluted point site assemblages and their distribution across eastern New York State; technological characteristics of early, middle, and late Palaeo-Indian lithic industries; and proposed variable subsistence adaptations, based on a dynamic, rapidly changing environment. The information presented in the 39 pages of this initial chapter is dense, as is that in the succeeding chapters.

Moving east from the "gateway to the Far Northeast" (Lothrop and Bradley infra. 38), John Crock and Francis Robinson IV present the latest

information on the distribution of sites attributable to early, middle, and late Palaeo-Indian occupations, as well as fluted point findspots across the state of Vermont, in a chapter entitled "Maritime Mountaineers." Again, the site data are detailed and comprehensive, including updated information on the famous Reagan site, first reported by Ritchie (1953). The use of metamorphic toolstone, particularly quartzite, lends a different character to the early Palaeo-Indian Mahan site assemblage, although the tool kit is considerably more sophisticated than the vein quartz industry of the reputedly contemporary Heritage Hills site to the north, in the Ottawa River valley (Swayze and McGhee 2011). Current palaeoenvironmental reconstructions are combined with lithic sourcing to address questions concerning population movement and evolving subsistence practices throughout the Palaeo-Indian occupation of the region.

Richard Boisvert next provides an overview concerning the Palaeo-Indian period in New Hampshire. His "History of Research" section describes just how limited the database was until two decades ago and how important cultural resource management projects and State programs have been since that time. A map presenting site and isolated find distributions complements a table providing information concerning site type, size, geographic setting, and range of Palaeo-Indian period components. His admittedly limited sample of sites displays an association with wetlands at lower elevations and with lithic sources such as Mount Jasper in the uplands. Boisvert concludes with a review of Palaeo-Indian point styles and dating, noting that there is no evidence for a true "Clovis" occupation in the far Northeast.

The concluding chapter of Part I, by Spiess, Cowie, and Bartone, defines a series of fluted point site clusters in the study region. Beginning with a review of Palaeo-Indian point typology and current palaeoenvironmental models, the authors proceed to define a series of geographic site clusters; including, from southwest to northeast, Turner's Falls, Bull Brook, Michaud, Jefferson, Vail, and Debert. The evidence from Vail and Michaud is then considered in detail in an attempt to determine whether all the sites in these particular clusters represent a single or limited multi-seasonal use of the area by Palaeo-Indian visitors. Based on point typology and toolstone representation on the various components of these clusters, it is concluded that both areas "remained a useful seasonal geographic focus for caribou hunting over centuries during the Younger Dryas."

The first chapter of Part II provides readers with an extremely detailed update on the famous Debert and associated Belmont sites in Nova Scotia. Two aspects of Rosenmeier, Buchanan, Stea, and Brewster's report stand out: the sophistication of the research related to local geomorphology, especially the soils analysis and LIDAR-based topographic recording, and the close working relationship with the local Indigenous community, the Confederacy of the Mainland Mi'kmaq. The latest calibration of the 13 Debert dates is also presented; it is integrated with the detailed sediment analyses to provided two potential depositional scenarios for the Debert/Belmont site complex. The first suggests that the Palaeo-Indian occupation dates to the Late Allerod (c. 13,000–12,800 cal. RCYBP), and the second proposes that the Palaeo-Indian activities occurred at various locales and times during the subsequent Younger Dryas (c. 12,800–11,600 cal. RCYBP) climatic event. Recent research has added two new sites and four additional loci, resulting in a complex of six sites covering an area of roughly 100 hectares, and possibly spanning a millennium of Palaeo-Indian activity.

Chapter 7, by Claude Chapdelaine, introduces the reader to the Cliche-Rancourt site, in the Lac-Mégantic area of Quebec. A detailed and comprehensive description of the artifact assemblage follows, including metrics and raw material. Chapdelaine then turns to the distribution of tools and debitage across the site to define four activity areas, or loci, which, he argues, are not coeval. Projectile point morphology suggests a middle period occupation (c. 12,500 –12,200 cal. RCYBP), while the toolstone evidence seems to indicate direct

procurement of Munsungun chert from sources located to the northeast. Chapdelaine suggests that the Cliche-Rancourt occupation reflects seasonal late summer travel into a tundra caribou hunting terrain in the Chaudiere River valley by a group based in the Kennebec River valley to the south, and he believes that the site may not represent the earliest entry into the Lac-Mégantic region.

Courchesne, Masse, and Girard follow up with a chapter focusing on the geomorphology and palaeoecology of the Cliche-Rancourt site, presenting the results of their detailed soils analysis. They also introduce the fact that there is a Late Palaeo-Indian (11,500–10,750 cal. RCYBP) component to the site, represented in Areas 1 and 2. The deep burial of some of the assemblages, particularly the Early Palaeo-Indian, raised questions about the type of soil processes responsible. Four soil profiles were excavated, and were horizons sampled for chemical, physical, and mineralogical analysis, and those properties were then used to identify the soil types. However, the major thrust of their study involved soil horizon disturbance, or pedoturbation. The study of the profiles, combined with the range of artifact depths, generated a complex history of cryoturbation, faunalturbation (animal burrowing), and floralturbation (tree throws) on the Cliche-Rancourt site.

In chapter 9, Brian Robinson considers the famous and unique Bull Brook Early Palaeo-Indian site from a palaeoenvironmental standpoint, arguing that its location relates to an adjacent island in the Gulf of Maine. He suggests that, at a 60 m below present sea level stand (c. 12,500 cal. RCYBP), an enlarged Jeffreys Ledge may have provided an attractive tundra-vegetated landscape for caribou herds to congregate and graze. Robinson's "Caribou Island" model may explain the unusually large agglomeration of Palaeo-Indian hunters represented by the Bull Brook site.

Using current palaeoenvironmental and archaeological models, in Chapter 10, Francis Robinson IV reviews the Reagan site evidence as an introduction to his study concerning the Palaeo-Indian occupation of the Champlain Sea littoral. He outlines the dating challenges which have plagued the reconstruction of this waterbody's history, and he concludes that present evidence suggests that the Champlain Sea may have existed throughout the Palaeo-Indian period (c. 13,000–10,000 cal. RCYBP). Robinson IV then considers floral and faunal evidence combined with site distribution data to propose a broader subsistence regime than is currently understood to have been the case for Indigenous populations at this time. He provides detailed and updated site and findspot distribution information relative to Champlain Sea strandlines in Vermont for five different Palaeo-Indian projectile point styles. These data are considered in light of local palaeoenvironmental reconstructions, current archaeological models of northeastern Palaeo-Indian subsistence (particularly caribou procurement), and ethnographic data relating to subarctic Indigenous groups such as the Chipewyan, leading Robinson IV to conclude that more accurate and nuanced models of Palaeo-Indian subsistence, including scheduling for marine resources, can be developed in the Northeast.

The concluding chapter, by Jean-Yves Pintal, reports on recent discoveries in the Quebec City area. Following a review of palaeoenvironmental evidence from the Strait of Quebec region, he presents data from the local cultural resource management industry's "grey literature" relating to Late Palaeo-Indian and Early Archaic occupations, defining four phases. Pintal notes that Late Palaeo-Indian bifaces of local chert differ somewhat in form from contemporary assemblages characteristic of populations to the south and west, and he suggests that some local Late Palaeo-Indian lanceolate points may be coeval with Early Archaic–style corner notched bifaces, similar to the cultural interface documented to the west (Pilon and Fox 2015). The earliest faunal evidence from the region, derived from an Early Archaic site (c. 9,000–8,000 cal. RCYBP), reflects a diverse subsistence regime (seal, bear, beaver, turtle, and bird), which includes the exploitation of marine resources. Pintal concludes by noting the range of later radiocarbon dates characteristic of Late Palaeo-Indian sites in the lower St. Lawrence River region.

What struck this reader is the wealth of detailed information presented in this volume concerning the initial Indigenous colonization and occupation of the "far Northeast." Particularly interesting are the earth science contributions, as they speak to the specific environmental conditions faced by these pioneering populations in the "new world" exposed by the retreating Laurentide ice sheet. The maritime adaptation suggested by several regional site distributions hints not only at more complex subsistence regimes, but also at the technology required to travel and acquire marine resources. While a maritime adaptation is not a new concept, the book reminds us not to underestimate this capacity among Palaeo-Indian populations. Finally, Pintal's work addresses the early Holocene exploration and settlement of the Canadian Shield to the north, which may have entailed the merging of two cultural groups.

The excellent production quality of this volume is equal to that of the amazing *Paleoamerican Odyssey* volume published by the same press; it is thus no surprise that the *Far Northeast* volume received a *Choice Magazine 2014 Outstanding Academic Title* award. There is no doubt that the volume will stand the test of time and constitute a foundation for future research throughout the region, as has been illustrated in a recent northeastern Palaeo-Indian period synthesis published in the journal *PaleoAmerica* (Lothrop et al. 2016). I consider the book to be well worth the $68.00 US cost (despite the fading Canadian dollar). All the contributors and the editor are to be congratulated.

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