Vers une anthropologie des catastrophes
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Réduire les résumés

The mid seventeenth century collapse of Iroquoian Ontario:
examining the last burial place of the Neutral Nation

Mary JACKES

Key-words – Iroquoian, mortuary practices, demographic estimators, ethnohistory, New France.

Abstract – A catastrophe overcame the Neutral Nation of Ontario, Canada, in the first half of the seventeenth century: the Neutral ceased to exist as a nation, although they had been described since the French first met them in 1610 as strong, healthy and numerous. They lived in the most fertile and warmest part of Ontario. They were determined to remain neutral in the conflicts between the Iroquois from south of the Great Lakes and the Ontario Iroquoians who lived to the north of the Neutral. They throve on trade, rather than war. Nevertheless, by the early 1650s, the Neutral Nation was destroyed. We can guess at their fate, by reference to Jesuit descriptions of what happened to their closely related Iroquoian neighbours, by brief French reports and by analysis of the Grimsby cemetery. The demographic profile of those buried in the Neutral cemetery at Grimsby, Ontario – a salvage excavation with cursory osteological analysis allowed under strict constraints at a time of aboriginal protest against bioarchaeology in North America – gave a picture of high fertility and an increasing population. Since this is a rare case in which we can actually know from independent evidence some details of the lives of those buried, the Grimsby cemetery serves as an object lesson in how one must be wary of unusual demographic profiles in the absence of supporting data. In this case, there are explanations for the apparent (not real) high fertility which will be examined within the context of what we know of Iroquoian health and fertility. Further evidence comes from the sequence of graves, moving from highly formalized to more haphazard burials with the sequencing assisted by analysis of trade beads. The paper examines mortuary practices in the context of social disruption and will outline factors which caused bias in the buried population.

The mid seventeenth century collapse of Iroquoian Ontario: examining the last burial place of the Neutral Nation

Mots-clés – Iroquoiens, pratiques funéraires, estimateurs paléodémographiques, ethno-histoire, Nouvelle-France.

Résumé – Dans la première moitié du XVIIe siècle, une catastrophe a anéanti la Nation Neutre de l'Ontario, au Canada. Bien que, depuis 1610, ils aient été décrits par les Français comme forts, sains et nombreux, les Neutres ont totalement disparu. Ils vivaient dans la partie la plus fertile et la plus chaude de l'Ontario. Ils

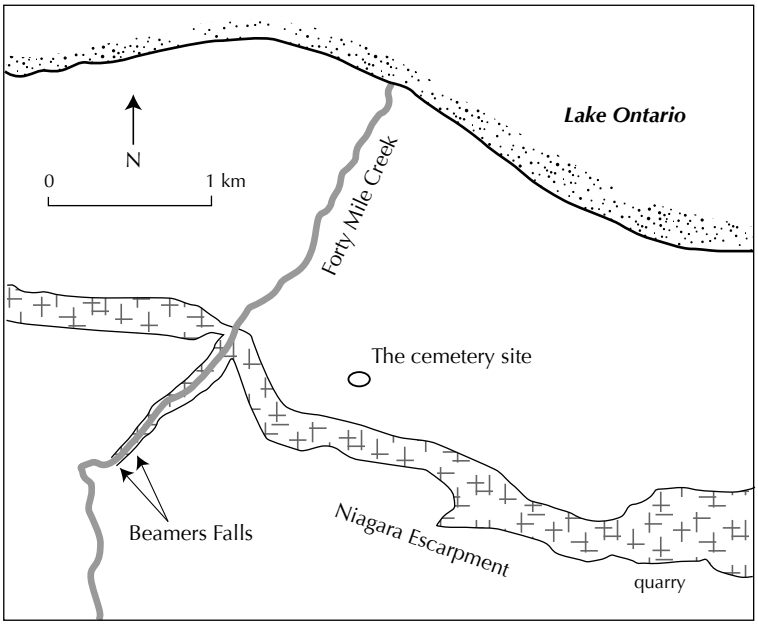

Fig. 1. *Sketch map of the environs of the Grimsby Neutral cemetery.*

Introduction

In 1976, a cemetery of the Neutral Nation of Iroquoian people was discovered in Grimsby, Ontario during preparation for construction of a housing development[2]. The cemetery lay at 100 metres above sea level, sheltered in an embayment of the Niagara Escarpment, and was dug into a one metre deep sand deposit close to where Forty Mile Creek enters a very narrow portion of the Lake Ontario margin, less than 2 km wide (fig. 1). The creek descends from 190 metres above sea level via a two-level waterfall of an unusual configuration for the Niagara Escarpment. The waterfall forms the major migratory flyway for raptors in the spring, especially for several species of hawks[3]. There is a nearby chert source[4], but no village has been found associated with the cemetery. Known Neutral villages lie in the upland flood plains of rivers.

2. The cemetery was located in Concession 2, Lot 7, Grimsby Township, Lincoln County, Ontario (AhGv-1 is the Borden site designation). When the excavation ended in early April 1977, the exposed graves covered an area of 32 by 12 metres within what is now called Sunrise Crescent in Grimsby (Kenyon, 1982, p. xviii, 8). The skeletons were reburied within two months, close to the original site (Grimes, 1986 provides some background regarding this).
3. Based on statistics kept since 1975: see http://www.hwcn.org/link/niaghawk/
4. The Goat Island member of the Lockport formation consists of dolostone with nodules of Ancaster chert. It is well exposed in the gorge of the upper falls and in an escarpment margin quarry (AhGv-2) several kilometres south east of the falls. While scattered 17th century Neutral artifacts have been found along the escarpment base within ~10 km to either side, no other definite sites are known (Archaeological Data, Ontario Ministry of Culture; Fox, *in litt.* 21/01/1983, referring to the survey work of Leslie).

The Neutral were established in the area between the Grand River and Lake Ontario by ca. AD 1550 (Lennox, Fitzgerald, 1990; Warrick, 2000), and in the late 16th and early 17th centuries, they lived in clusters of villages. In 1616 the Nation was estimated to have 40 villages (Champlain, Biggar, 1922-36, vi, p. 249) and 4 000 warriors (Champlain, Biggar, 1922-36, iii, p. 99). Eight years later, Sagard who lived among the neighbouring Huron Nation in 1623-1624, stated that the Neutral were very powerful, with 5 000 or 6 000 warriors (Sagard, 1939, p. 157). In 1626 there were said to be 28 large permanent villages or towns and many smaller hamlets (Charlevoix, 1870, i, p. 265). In 1634, the Neutral were recorded as numbering many tens of thousands [Thwaites, 1896-1909, (*Jesuit Relations*: henceforth JR), 7, p. 223: "there are more than thirty thousand souls [among the Huron]. The Neutral nation is much more populous…"].

Early French accounts describe the Neutral as exceptionally strong and healthy (JR, 21, p. 19), and the area as rich in resources for hunting and gathering (*e.g.* Leclercq, 1881, i, p. 269; Sagard, 1939, p. 225; Charlevoix, 1870, i., p. 269-270). The population was apparently increasing and well-settled between Lake Ontario and Lake Erie (fig. 2), still the environmentally richest and warmest part of Ontario.

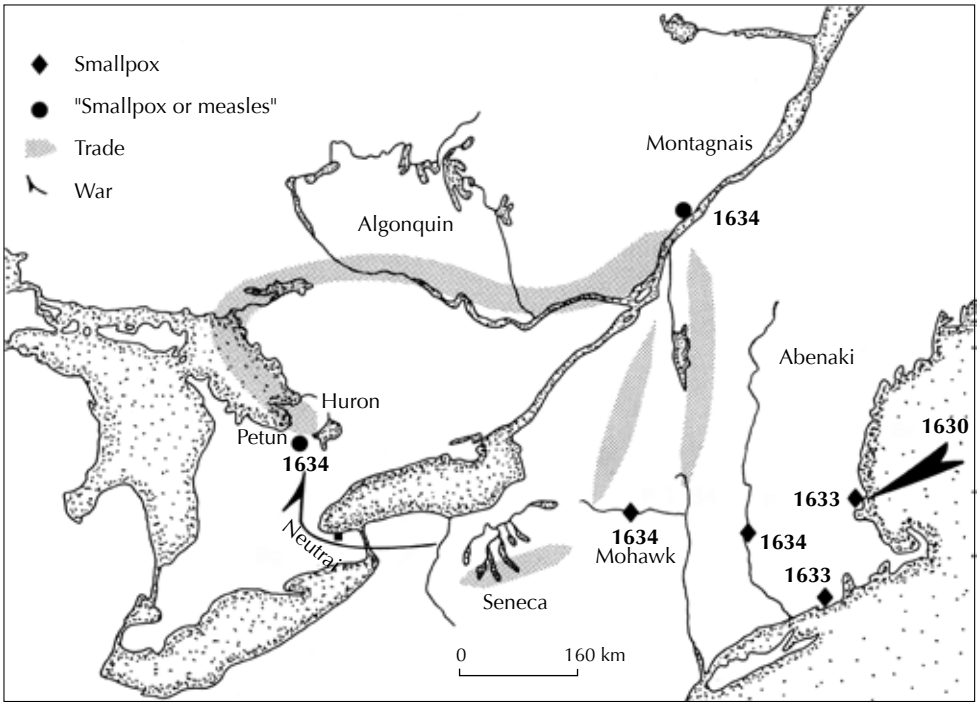

Fig. 2. *Recorded epidemics of the 1630-34 period, beginning with the introduction of smallpox into Massachusetts in 1630 from England. The map also shows trade routes and locations of Iroquoians and some other aboriginal groups in the seventeenth century. Over one thousand Seneca warriors passed through Neutral country in 1634. The location of Grimsby is marked by the square on the south west shore of Lake Ontario.*

The Neutral were active traders. They made war only with some Algonquian speaking peoples to the west and were neutral (Champlain, Biggar, 1922-36, iii, p. 100; iv, p. 283; vi, p. 249; JR, 21, p. 193) in the conflicts among other Iroquoians, although Sagard (1939, p. 151, 157) recorded that some Huron wished to wage war on the Neutral. No doubt their geographical position between the Huron and the Seneca (fig. 2) with regard to trade, was a significant factor in this neutrality, which has been ascribed to a variety of elements such as maize and tobacco (which they grew, Sagard, 1939, p. 158), black squirrel furs, the quality of the chert locally available to them, without any certainty as to which were of any, or of primary, importance (see *e.g.* Rotstein, 1988). Noble (1984) has suggested that this neutrality functioned to provide a type of sacred sanctuary.

The Neutral were said to be powerful and strong and warlike (Leclercq, 1881, i, p. 266), while the Huron Nation was described as "timid" (*fort craintive* in the original seventeenth century French), fleeing in the face of the enemy (JR, 10, p. 95).

The nature of contact with Europeans

Although there had been European fishermen and whalers in Canada since the 15th century, there is no reason to believe that they had direct contact with the Ontario Iroquoian nations. French exploration of the St. Lawrence River as far as the island of Montreal revealed the existence of Iroquoian settlements along the river in 1534-6 and 1542-3. However, in 1603 Samuel de Champlain recorded that the St. Lawrence was depopulated (the reasons for this are debated, see *e.g.* Jamieson, 1990; Trigger, 1987, p. 215-228; Ramsden, 1990, p. 383). Those who had lived in the area of Montreal, or perhaps only the women and children, might have joined Huron from southern and eastern Ontario who moved north and west and consolidated in what had became Huronia by the early 17th century (fig. 2). We therefore have no record of European contact along the upper reaches of the St. Lawrence in the last half of the 16th century, and certainly expect none further to the west in Ontario. Nevertheless, European trade goods began to appear in Huron ossuaries towards the end of the 16th century, even before the Iroquoian consolidation into Huronia (*e.g.* for example, iron axes and trade beads at Kleinburg: Turgeon, 1998; Hancock *et al.*, 1994). Thus, there were possible routes of transmission for diseases imported from Europe prior to direct contact.

The first direct European contact for the Huron population at large was with Etienne Brûlé who was sent by Samuel de Champlain in 1610 to travel west from Quebec. For the rest of his life he travelled with or lived with Ontario First Nations peoples and it is presumed that he spent most of his time among or with the Huron. In September 1615, Brûlé must have passed briefly through the territory of the Neutral Nation, guided by Hurons. It is very likely that he later spent some time with the Neutral: unfortunately, nothing is recorded of what he learned, although Father Joseph de la Roche-Daillon in 1626 said he wished to go to the Neutral country specifically because Brûlé reported wonderful things about it (LeClercq, 1881, i, p. 264; Butterfield, 1898, p. 111-112 assumes that Brûlé had spent the previous winter with the Neutral).

From 1610 onwards, Huronia was only sporadically in direct recorded contact with Europeans, apart presumably from Brûlé. Until he was killed and eaten there in 1632 (JR, 10, p. 305), Brûlé was the only consistent European resident. Nevertheless, Europeans did go to Huronia for short periods: Champlain (Biggar, 1922-36, iv, p. 240) records encountering 13 or 14 Frenchmen there in mid-August 1615. We know little of the fur traders since the written records are of Champlain or of missionaries who were originally Recollets, reformed Franciscans. Father Joseph Le Caron set out in July, 1615 for Huronia arriving only a few days before Champlain, and both he and Champlain stayed for a year. Le Caron returned to Huronia with two other Recollets, Father Viel and Brother Sagard, in 1623. A year later Viel was left on his own while the others went to France to beg for help from the Jesuits. He stayed alone for a year, leaving no record when he drowned in 1625 on the long and dangerous return journey to Quebec (via the northern trading route shown in fig. 2). In 1625, the Jesuit Jean de Brébeuf went to Huronia, accompanied from 1626 to 1629 by the Recollet de la Roche Daillon.

From 1629 to 1632, New France was held for the British by the Kirke brothers (who were, in fact, French), and there were no trading expeditions from Huronia to the St. Lawrence valley (Charlevoix, ii, p. 66)[5]. With the return to French rule, a new spirit governed New France. Richelieu created the Company of New France with the idea of settling hundreds (specifically French and Roman Catholic) families in the colony. Trois Rivières was started in 1633 (Butterfield, 1898, p. 151), Montreal nearly ten years later, bringing French settlers ever closer to aboriginal fur traders. There were very few French Canadians in 1629-1633 (Eccles, 1983, p. 24), including only one family (JR, 5, p. 41): it is worth noting that some had been captured and transported to England and that from 1629 until 1634 there was a great deal of movement of people among England, Quebec and France – an ideal situation for the importation of disease. In March 1633, Champlain left Dieppe with a fleet of three vessels for the two month journey to Quebec. On board there were fur traders, soldiers, artisans, labourers, a woman and two children, about 200 in all, and others, including more children, followed (Dionne, 1912, p. 245, 252).

The mission to the Huron was revived in 1634. The arrival of the Jesuits marks a more consistent record of what happened in Ontario, for it was incumbent upon the Jesuits to write letters and reports, mostly published as the *Jesuit Relations*. The letters of interest to us begin in 1634. From this time on, the ethos seems to have changed: missionary zeal, with a Counter-Reformation flavour to it, seems to have been more important than trade (Bosher, 1993) and the majority of the laymen known to be in Ontario had taken certain religious vows (Côté, 1955). Nevertheless, trading expeditions to Quebec remained important to the Huron, and their enemies, the Iroquois, tried to disrupt it – so successfully that trade came to a complete halt in 1642-44 because of an Iroquois blockade. But it is obvious that from 1610, the almost

5. Jean Nicollet, interpreter and explorer, is said to have taken refuge with the Huron and persuaded them not to trade with the English. He was evidently more devoutly Catholic and loyal to the French than Brûlé (compare JR, 9, p. 215-217 on Nicollet's devotion, with Sagard 1939, p. 171, on rebuking Brûlé for engaging in native practices), whereas Brûlé assisted the English takeover of Quebec (JR, 5, p. 241; Charlevoix, ii, p. 50).

yearly trading trips from Huronia to Quebec, plus the presence of a varying number of French in Ontario, whether traders or missionaries, meant that there was the potential for great disruption. Although there is a continuing debate over how much disruption was caused by the fur trade, whether aborigines were passive victims or partners, the Jesuits certainly recorded (JR, 8, p. 57) that the Huron had so over-hunted beavers in their territory by 1634-5 that they had to go elsewhere to find the pelts for trading. The changed emphasis in economic and subsistence spheres of life can only have disrupted food supplies and families.

European contact with the Neutral

Neutral contact with Europeans was not so direct, in large part because the Huron tried specifically to exclude the Neutral from direct trade with the French. Champlain wished very much to visit the Neutral but was dissuaded from doing so by the Ottawas, Algonquian speaking trading partners of the Huron and French (Champlain, 1929, iii, p. 100; iv, p. 283). In the winter of 1626, the Recollet missionary de la Roche Daillon spent several months among the Neutral who were quite interested in trading with the French. But the Huron became worried that their trade would be undercut, so they circulated stories that Daillon would cause death and destruction through sorcery (LeClercq, 1881, i, p. 267-269) and Daillon was recalled to Huronia because of rumours that he had been or would be killed. When, in 1640, the Jesuits attempted to set up a mission in Neutral territory, the Huron made sure that the Neutral were hostile and unwelcoming (JR, 18, p. 41). Chaumonot (2002, p. 27-28) makes the interesting observation that the Neutral were offered nine iron axes in return for killing the Jesuit fathers. He commented that iron axes were rare among the Neutral and they still used stone axes to cut trees, so that this offer was very tempting, indicating that Neutral access to trade goods was much less than that of the Huron.

We might assume, then, that the circumstances of Neutral life were better than those of the Huron, for whom we postulate introduced disease, disruption of normal life by the fur trade and by the presence and activities of the French missionaries. Yet the Jesuits write that "Many of our Frenchmen, who have been here, have in the past made journeys in this country of the Neutral Nations for the sake of reaping profit and advantage from furs…" (JR, 21, p. 203), implying that there had been contact. And Sagard (1939, p. 194) gives indications that there were not only French traders among the Huron, but there were also French visitors to the Neutral. At least one female buried in Grimsby is clearly of mixed parentage (Jackes, 1988)[6]. The Jesuits regarded the Neutral women as particularly shameless: *Ils semblent plus desbordez & impudents en leurs impudicitez que nos Hurons* (JR, 21, p. 196).

6. Champlain complained of the sexual mores of the Huron girls (Biggar, 1922-1936, iii, p. 47) and the Jesuits found the Neutral particularly difficult in this regard (JR, 27, p. 23). Brûlé was considered to be licentious; indeed one of the Jesuits referred to him some years after his death as having lived "a scandalous life" among the Huron (JR, 10, p. 309-311). There is no reason to doubt that children of French traders were born in Ontario. Feature 9/1, the individual referred to here, was buried with exceptional grave goods (Kenyon, 1977), some specifically dating to the period after 1630 (Lennox, Fizgerald, 1990, p. 423).

Between November and March 1640-1641, two Jesuit fathers, Jean de Brébeuf and Pierre Joseph Marie Chaumonot, travelled from Huronia and passed through eighteen Neutral Nation settlements. They stayed in ten villages in which they estimated there were about 500 fires (two families shared each of the several hearths which were located along the centre of a longhouse) and 3 000 people. The Jesuits noted that there had been three years of "unusually prevalent" war, famine and sickness, but that there were still about 12 000 people and 4000 warriors in about 40 villages and hamlets (JR, 20, p. 95, 105; 21, p. 189, 191, 223).

It is unfortunate that letters written by the two Jesuit fathers while among the Neutral were lost en route to Huronia. Chaumonot's autobiography (2002) does not contain much detail on his visit to the Neutral, and Brébeuf was killed by the Iroquois in 1649, so written records of the Neutral are limited.

The demography of the Grimsby cemetery

Beads, especially European trade beads, provide a date for the Grimsby cemetery: Fox and Kenyon (1986) suggest that the cemetery spans at least 30 years. Three phases are distinguished (II, IIIa and IIIb), each lasting about 10 years and – as will become evident – the terminal date must be 1651. Sempowski *et al*. (2001, p. 513) suggest that trade beads were not personal possessions which were retained, but rather goods that were used specifically as mortuary items. Thus, trade bead variations provide relative dates for sites because they were not retained and circulated over long periods of time. The variations can relate to details of manufacture. The royal blue glass trade beads from Grimsby have been confirmed as of the same date as similar beads from Ossossané, for which the date (1636 or later) is known (Kidd, 1953); the chemical composition of some subsets of beads from the two sites is identical (Hancock *et al*., 2000). However, trade bead variations relating to specific details of design and colour are the determinants of the phases. Kenyon (1986) summarizes the situation by noting that phase II on Neutral sites is dominated by white beads with a few blue and black examples occurring and red virtually unrepresented. In phase III, however, the situation is reversed: over 60% of beads are red, though there are some blue, and no more than a few are white. It is possible that this shift in trade beads, from dominant white to dominant red took place in Huronia somewhere around 1620. By 1630, red beads were common, and in the Grimsby cemetery they jump from none in phase II to close to 90-100% in some phase III graves.

Not all burials had sufficient numbers of beads to be evaluated and Kenyon and Fox (1986) analyzed the beads in only 19 features. However, Fox (*in litt*. 21/01/1983) suggested the total number of features (mostly burial pits) recognized as definitely or possibly belonging to the three bead phases are as follows: six features might be ascribed to phase II, 11 features to phase IIIa and 14 features to phase IIIb. In general terms, the graves of each phase clustered in separate areas of the cemetery, phase II forming a node in the south west and the phase IIIa and IIIb features fanning out to the east and north east (fig. 3).

The cemetery may reflect a special set of circumstances. No associated village has been found and the size and time depth of the cemetery are unique among known Neutral sites. Lennox and Fitzgerald (1990, p. 414), in noting the trade bead phases associated with Neutral

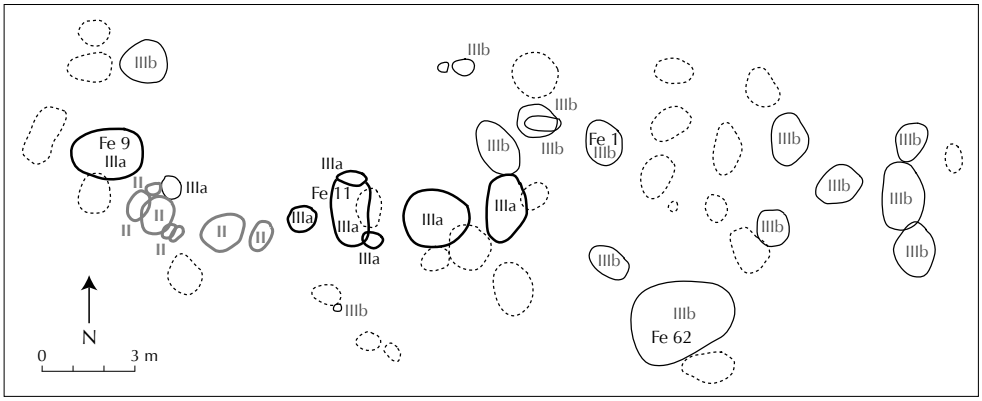

Fig. 3. *The burial features in the Grimsby Neutral cemetery, showing the distribution of the three bead phases across the site. Features which could not be identified to bead phase are shown by dotted lines.*

sites, list only Grimsby as a site containing more than one bead phase. Fox has speculated that the length of time the site was used, the absence of a village and the setting perhaps indicate "some spiritual significance" (*in litt.* 21/01/1983). In this paper, I draw attention to factors that seem to make the site special – the location, the waterfalls, the migration of raptors overhead[7].

I have noted (Jackes, 1996) that there is rather poor information on most Neutral burial sites and that Grimsby provided the opportunity for the first full excavation of such a site. While there had previously been unsupported claims that all Neutral burials were of a specific type (an ossuary pit of disarticulated skeletons separated into upper and lower compartments by sterile clay floors, with peripheral burials), it seemed very likely that we did not know what a "typical" Neutral burial was like, and that among the variations at Grimsby, we would find examples of the "typical" burial. Noble (1985) suggested, however, that the cemetery must be "untypical", and represent epidemic disease because of the variability of the burial types.

Our question is then, what can palaeodemographic analysis tell us about the Grimsby cemetery?

The cemetery was a complex mixture of single and multiple burials: the graves (or "features") contained from 1 to 103 people (total n = 373) (fig. 3). The overall sex ratio of individuals 15 years of age and over is 1:1 (n = 243) but the burial features differ markedly.

We can only speculate on why the graves range from having 1 to 103 buried individuals. Kenyon (1982, p. 231) suggested that larger features were the graves of those buried after the ground had thawed in the spring, while smaller features were summer and early autumn burials. The degree of articulation in the smaller features (Jackes, 1996, p. 132) certainly argues for primary, in-flesh burial, and 60% of the features were of this type, containing only

7. Williamson and MacDonald (1998, p. 126-127) note thunderbird images in Neutral territory in this period.

one or two individuals. However, the range of variation within the larger features is such that the explanation must be more complex than seasonal burial alone. The most elaborate grave (Feature 62) is reminiscent of other – unfortunately less well-documented – Neutral burials (Jackes, 1996, p. 138) and while this may be "typical" of Neutral burial practices, its size alone sets it apart. The other large features are different from Feature 62 and vary in sex ratios, juvenile to adult ratios and details of burial.

Methodology

A first attempt to understand North American archaeological demography by a comparative methodology (Jackes, 1986) used probability of death, q_x, values (also called mortality quotients) as indicators of mortality, since the standard methods of deriving crude death and birth rates could not be applied to these sites. The reason for this is that the q_x values for all individuals (apart from 26 indeterminate adults) at Grimsby show two things: firstly, that infants and young children were under-represented (they were in fact often buried separately, Lennox, Fitzgerald, 1990, p. 455, so that it is unlikely that a complete representation could be obtained); secondly, that adult age estimates are no more than approximations and are considered too unreliable to allow full demographic analysis from age at death data (Jackes, 1985; 2000).

My research led to the conclusion that some mid-western sites from the Late Woodland period had high mortality. Grimsby, although more dependent upon cultivars, apparently belonged in this high mortality group, together with Ossossané, a Huron ossuary where the burial ceremonies were perhaps described by Brébeuf in May 1636 (JR, 10, p. 193-305). Both burial sites seemed to have had high mortality in the 10-19 year age group. This immediately presented a problem, in that available evidence did not suggest differential high adolescent age-specific mortality for any of the known diseases which afflicted Ontario during the period from 1620 to 1650 (Jackes, 1986; 1996).

Overall, the mortality at Grimsby was as high as the Larson Site, an Arikara cemetery of the late eighteenth century. This appeared to be in line with what could be expected of post-Contact introduced disease. But I had serious doubts, specifically because subadult mortality at Grimsby and Ossossané was higher even than at Larson (Jackes, 1986, fig. 2, p. 40)[8].

It is important to note that apparent high mortality among children actually indicates high fertility and there is every evidence that Huron and Neutral fertility was *not* in fact extremely high (Jackes, 1994). Huron ossuaries from earlier time periods suggested acceptable fertility levels derived from the skeletal evidence: total fertility rates (TFR - the number

8. High adolescent mortality would be unusual. Sköld (1997) reports a more even distribution of deaths over all age groups in an area similarly isolated from constant infection, but there is no indication of extremely high late adolescent mortality as at Grimsby. A breakdown of the causes of death among the Saami for 1750-1820 (the pre-vaccination period) shows variations over time: in 1750-60 smallpox mortality was just over 13% of total mortality and thereafter was 4-5%, falling below 2% by 1800. The Saami isolated smallpox victims whereas Huron disease treatments may have increased the morbidity and mortality rates (*e.g.* JR, 14, p. 63; 19, p. 89). But, in fact, Sagard (1939, p. 198) praises the isolation of some infected patients as being an excellent idea.

of live-born children within the reproductive life of an average woman) of around 5-6 accord with the ethnohistorical and historical evidence. How could Ossossané, but especially Grimsby, have had such high fertility levels? It became necessary to concentrate on fertility as a way of understanding this paradox.

Higher fertility just before the intensification of agriculture (derived from Jackes, 1986, p. 38) would be a reasonable assumption and I began to work on developing a method which would allow a comparative study of fertility levels during the late Mesolithic – early Neolithic in Western Europe in an attempt to understand if, and exactly when, fertility levels might have changed (Jackes and Meiklejohn 2008 represents the last of a series of papers on this question). The problem of Grimsby was set to one side until the method was developed and fully tested, but it remained of primary interest.

A comparative approach to discerning large-scale trends, such as alterations in fertility levels in association with subsistence changes, or following European contact, requires that the sites used be suitable components of such a test, that they represent a biological reality. In the past, palaeodemographers accepted determinations of excessively high mortality (drawing criticism such as that of Howell, 1982), and it is just as important that palaeodemographers do not accept demographic values which imply unrealistically high fertility[9]. When demographic estimators fall above certain levels, the demographer is implicitly stating that the *average* woman has 12 or more live-born children in that society (a TFR of 12 is the highest recorded, Eaton, Mayer, 1953). Obviously, maximum human fertility, as distinct from the TFR, is above 12. Women have had more than 12 children; in exceptional cases, many more. Nevertheless, the exceptional is not relevant to palaeodemographic analysis and we must deal with the most probable and the average, not with the least probable exceptions. The probability of becoming pregnant within a year (that is, twelve reproductive cycles) is 90% or less, even in the 20-25 age group and even under the most favourable conditions (Joffe 2000; Bongaarts, 1975; Dunson *et al*., 2004; te Velde *et al*., 2000). Fertility determinants and constraints have been discussed previously, in general terms and with particular reference to Iroquoian Ontario in the 17th century (Jackes, 1994; Jackes *et al*., in press; Jackes, Meiklejohn, 2004; 2008). The whole issue is contentious, as can be seen by following merely one set of papers, focusing on lactational amenorrhea, culminating in the comments in Konner *et al*. (1985): nevertheless it is clear that several of the characteristics of Iroquoian society constrained fertility (Jackes, 1994).

Engelbrecht (1987) concluded that the fertility of the New York Iroquois was so low that adoption of war captives, especially women and children, was a mechanism for maintaining population levels. The French did indeed see low numbers as a problem for the Iroquois: Chaumonot (2002, p. 34) told the Iroquois that if they were to maintain marital stability, they would not have to resort to war as a method of increasing their family size. The Jesuits also complained specifically about the Neutral in regard to marital instability (JR, 8, p. 151).

9. As discussed in Jackes and Meiklejohn (2004) the value P, which is actually ${}_{15}q_{5'}$ proposed by Bocquet-Appel (2002) and Bocquet-Appel and Naji (2006), implies fertility levels over 12 when it reaches about .350.

Besides cultural factors, we need to take into account diseases which can cause infertility, *e.g.* genital tuberculosis (tuberculosis was well-established in Ontario before the 17th century; Pfeiffer, 1984), syphilis (present at Grimsby, Jackes 1988) and smallpox (Rutten, 1993 states that smallpox did not depress Dutch male fertility, but Saami data contradict this, Sköld, 1997). Beyond the alteration in normal behaviour caused by epidemics of infectious disease, crises induce lowered fertility, not simply from family disruption, delayed marriage and reduced coital rates. Jowett (1986; 1991) has shown that in China in 1960, infant mortality rose to nearly 300/1000 live births, but there was no compensating increase in the birth rate. By 1961, the Chinese national total fertility rate (the average number of live-born children a woman would have if the birth rate of that year lasted throughout her reproductive life) fell to 3.3, almost half what it had been only four years before, partly no doubt due to famine amenorrhea. In times of famine such as in China in 1960-61, not only is there death and a reduced rate of conception, there is a lowered live birth rate. Cai and Feng (2005) demonstrate that part of this depressed fertility comes from an increase in stillbirths, but also from an even larger increase in miscarriages. There is, of course, a normal minimal rate of foetal wastage, perhaps 15% of all conceptions (Quenby *et al*., 2001), but the Chinese data show that famine will increase that rate markedly. Cai and Feng (2005) provide evidence that social disruption and stress, in the absence of famine, may also reduce fertility rates (even below replacement level in Shanghai during the Cultural Revolution).

To repeat what was noted above: in 1640-41 the Jesuits estimated 500 fires and 3000 people in ten Neutral villages (JR, 21, p. 223), an average of six people per fire. Since each hearth was shared by two families, the implication is that Neutral families were very small, for which low fertility and three years of famine, war and disease can be adduced.

Results

The under-representation of children under 5 years and the inaccuracy of adult age estimates require the use of demographic estimators. The ratio of juveniles aged 5 to 14.99 years to adults 20 and over (J:A) and the mean of the subadult mortality quotients (q_5, q_{10}, q_{15} – Mean Childhood Mortality, MCM) serve as palaeodemographic estimators. From these we can estimate a total fertility rate for the entire cemetery of 11 to 12, the total number of live-born children the average woman would have over her entire reproductive period (for the method details and tests of the accuracy of the method see Jackes, Meiklejohn, 2008).

Figure 4 presents the estimated fertility rates derived from the ratio of children to adults, demonstrating that Huron sites of the 16th and 17th centuries suggest a Total Fertility Rate (TFR) of ~4-6 in accord with the ethnohistorical literature (Jackes, 1994). Maurice (Jerkic, 1975) is dated at around 1640, and its low fertility is what may be expected from increased stress, reduced food intake, the effects of disease and heavy exercise (all the missionaries noted how hard Iroquoian women worked in comparison with the men). Ossossané, as originally analyzed (Katzenberg, White, 1979; Jackes, 1986) was based on a sample size of 249 which indicated very high fertility in the years prior to 1636. Two further studies of Ossossané have been done in the interim: one with a sample size of around 418 (Jimenez, Melbye, 1987) indi-

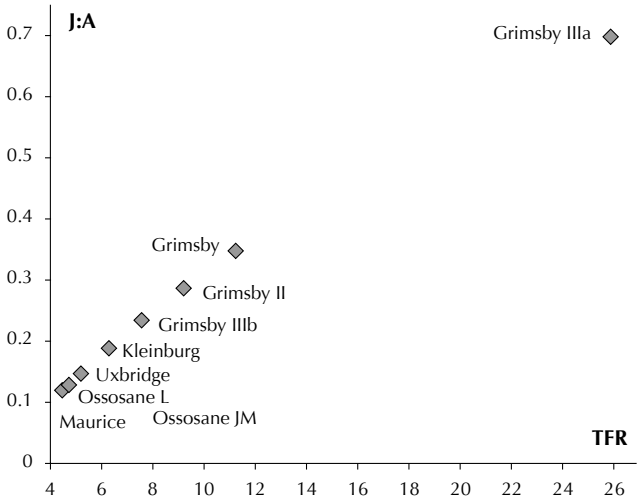

Fig. 4. *Fertility estimates for Ontario osteological samples: Maurice, Ossossané as analyzed by Jimenez and Melbye and by Larocque, Uxbridge, Kleinburg and Grimsby. The total fertility rate (TFR) is predicted by quadratic regression from the ratio of juveniles to adults (J:A.). Grimsby is represented by the total sample and by each of the three trade bead phases (II, IIIa and IIIb).*

cates a TFR ~4.5-6.5; a second (Larocque, 1991) with a MNI of 447 provides a very tight TFR estimate of 4.4-4.7. It is clear that, in fact, the Ossossané estimate should be in the range of 4 to 5. Uxbridge is extremely well studied (Pfeiffer, 1983; 1984; 1986), and should be regarded as providing a reliable estimate of pre-contact fertility at 4.8-5.2 (though tuberculosis may have reduced fertility slightly). Kleinburg again suggests that Huron fertility just before 1600 was probably not very high: analyses by Pfeiffer (1974) and Larocque (1991) both provide TFR estimates of 5-6.

The value of 11 to 12 for the total Grimsby cemetery is close to the maximum recorded TFR and cannot be correct because there is osteological and ethnohistorical evidence that the fertility of Ontario Iroquoians was half that (Jackes, 1994). Partitioning the total number of individuals excavated will give a better understanding of the reasons for the high fertility estimate.

The bead phase II sample is inadequate. Archaeological data based on sample sizes of less than ~100 cannot be relied upon (Jackes, Meiklejohn, 2004; 2008). A broad estimate range can be expected from a small sample and this is true of phase II (fig. 5).

Under-representation of adults is most marked in the features associated with trade beads of phase IIIa. The estimated total fertility rate for IIIa bead features is far beyond any biologically possible range (TFR of 25 to 26). Features with IIIb beads show a more "normal" distribution and fertility estimates are biologically possible. However, at 7.5-9 children, the IIIb fertility estimate is both wide and high. The adult sex ratio in IIIa features is .8 males/females, but in IIIb it is 1.4. There are thus very large numbers of women and children in the bead phase IIIa burial features, suggesting that we must question whether there are reasons for the abnormal demographic profile.

MCM	J:A	N		Estimation from MCM	Estimation from J:A
0.132	0.347	373	Total excavated	12.21	11.26
0.138	0.286	27	Bead Phase II	13.03	9.24
0.208	0.706	118	Bead Phase IIIa	24.78	26.31
0.105	0.233	163	Bead Phase IIIb	8.94	7.60
0.145	0.390	281	Bead Phases IIIa +IIIb	14.01	12.78
0.087	0.164	103	Feature 62	7.1	5.6

Fig. 5. *Grimsby cemetery total fertility rate estimates derived from the mean childhood mortality (MCM) and juvenile adult ratio (J:A) values.*

The causes of Grimsby palaeodemographic discrepancies

An epidemic struck Ontario in 1634 (Jackes, 1983, 1988). The disease may have derived from a smallpox epidemic that began in London in 1628. Recorded epidemics from 1630-34 were all perhaps the same smallpox epidemic initially spread by English settlers arriving in Massachusetts in 1630, and by Dutch traders, to the Abenaki and Mohawk. It might have been spread further by warfare when, in April 1634, 1500 Seneca warriors entered Ontario (fig. 2).

The nature of the 1634 epidemic

The 1634 epidemic in New France is described (JR, 8, p. 87, 89) as first affecting the Montagnais at Trois Rivières with high morbidity and some mortality. It infected the aboriginal members of the yearly trading expedition and, introduced to Huronia in the autumn, caused disruption to the seasonal work of fishing and harvesting. It was described as a "sort of measles or smallpox" (*une espece de rougeolle, ou petite verolle, differente toutesfois de celle de Frãce*…). The Huron complained that during the absence of the Jesuits (when the Kirkes held Quebec) there had been nothing but famine, implying that they were already in a malnourished state before the epidemic arrived and thus especially vulnerable.

Did the Jesuits not recognize smallpox or measles when they saw these diseases? They would be used to them as endemic diseases, most often striking young children. They would not previously have seen the diseases in an isolated (if not virgin soil) population, a malnourished, darker skinned people who commonly exposed more skin than Europeans and were painted and tattooed (JR, 38, p. 249, 251). I have also (Jackes, 1994) noted the possibility of pellagra under some circumstances. Pellagra may result in a rash on exposed skin[10]. Perhaps

10. It also leads to hallucinations and emotional instability, which is interesting given the emphasis on madness in the Iroquoian ethnohistorical literature. Indeed, just as the missionaries stressed that the Neutral wore fewer clothes, were more painted and tattooed than the Huron, so they said that there were more madmen (*fols*) among the Neutral (JR, 21, p. 198). Insufficient dietary protein combined with the disruption of normal cooking methods (perhaps the use of young corn, the introduction of ashes or soaking in calcium-rich groundwater) over many weeks, but less than five months (Malfait *et al.*, 1993),

such circumstances prevented a clear diagnosis in the early epidemics in New France. Oddly enough, Robert le Coq, a French layman, was so disfigured by smallpox, and his body, including his eyes, so covered with sores (*tout chargé de playes et d'ulceres*), that it was said to be "extraordinary" (JR, 19, p. 98-109). This was in 1640, suggesting that le Coq's was a much more severe smallpox than previously seen by either the Huron or the Jesuits, and yet, though abandoned without shelter, starving and exposed to heavy rainfall, he survived to be killed in August 1650 (JR, 35, p. 53).

Another disease lasted for many months in Ontario in 1636 and 1637, no doubt again exacerbated by previous malnourishment. There was famine in the winter of 1634-1635, followed by drought and fires from Easter until mid June (JR, 10, p. 35).

A smallpox epidemic began in 1638 in Boston and spread to Ontario in 1639 and 1640. The Jesuits were again sometimes unable to identify it with any certainty (JR, 16, p. 53). Chaumonot (2002, p. 26) still referred to the 1639 epidemic as "a kind of smallpox" when he later wrote his autobiography and described his first year in New France.

A case of smallpox?

Fe 1/33 was a particularly interesting bundle burial in Feature 1 at Grimsby. The individual had abnormalities of both hips and of both elbows. The diagnosis (Jackes, 1983) is of osteomyelitis variolosa, the disruption of the growing ends of long bones in children who have smallpox. While the age of Fe 1/33 is unknown (his skull was missing), he is likely to have been well into adulthood. The sternum and sacrum were both fused and the bones were osteoporotic. While age is uncertain in cases of pathology, Fe 1/33 must have contracted smallpox before 1639. The conclusion might be that the epidemic of 1634 was actually smallpox, or that smallpox had been present prior to any recorded epidemics (Jackes, 1983; 1988). The simpler conclusion is that Fe 1/33 had contracted smallpox through the Seneca.

Biased mortality?

We cannot absolutely rely on the words of the Jesuit missionaries, but phrases like that of Chaumonot in 1640 (JR, 18, p. 23), when he writes of a contagious illness which spares neither age nor sex and most often carries away young children (*les petits enfants*), give us indications of morbidity and mortality related to disease. The published text is translated into French from the original Italian, so without a check of the original there remains the possibility that he meant that those who could be baptized before death were mostly young children, but that reading seems unlikely. The passage suggests that the high adolescent mortality at Grimsby (see above) cannot be ascribed to the epidemics of the 1630s.

It is justified to consider that the demographic bias in the IIIa burials is not caused by disease alone but by an influx of women and children. The glass bead frequencies in Feature

could result in pellagra. It should be noted that periostitis and high rates of dental caries (particularly marked among females at Grimsby) are characteristic of Ontario Iroquoian skeletons (cf. Brenton, Paine, 2007).

11 cluster separately from those in other phase IIIa features; in fact they are said (Kenyon, Fox, 1986, p. 61) to be exceptional for all of Iroquoian Ontario. Feature 11 – together with Feature 9 – is exceptional in another way: both features contain many children and very few males. The explanation is likely to be an in-migration of women and children. In one way or another, war is the most probably cause of this.

Iroquoian warfare

Milner (1996) has argued that warfare was frequent prior to European contact and there is certainly evidence for this in Quebec and Ontario. Nevertheless, the ferocity of 17th century Iroquoian warfare may have resulted from the economic and biological pressures following European entry into northeastern North America. The success of the Iroquois may be attributed to several factors, for example, their less marginal geographical location. But the provision of firearms to the Iroquois by the Dutch (JR, 24, p. 271; 27, p. 69), while French policy was not to trade firearms, put the Huron at a disadvantage from 1640 onwards.

Why Iroquois attacks on their neighbours were so ferocious has been the subject of much debate (see *e.g.* Brandão, 1997; Blick, 2001), as illustrated by the various terms in the literature – "the Mourning Wars", "the Beaver Wars". In view of my comments (Jackes, 2004) with regard to the distinction between externally-directed violence and within-group peace among Iroquoians, the theory of Ernandes *et al*. (1996) that serotonin deficiency from the diet leads to fanaticism and aggressivity seems very inadequate. Without taking any position on the causes of the wars among the Iroquoians and the increasing intensity of Iroquois attacks on Huron and their neighbours the Petun and the Neutral, emphasis on adoption of prisoners of war is reasonable within the general context of Iroquoian society and the disruptions of introduced disease and trade. Sagard (1939, p. 159) himself noted the importance of female and child captives as substitutes for the dead. Modern authors concur that Iroquoian warfare was partly undertaken to replace the dead with war captives (Richter, 1992). The Jesuit understanding of the situation was that the Iroquois wished to kill many Huron, but *ne faire des deux qu'un seul peuple* – to incorporate the surviving Huron within Iroquois society (JR, 24, p. 296).

The Neutral also took captives. In 1640, the Neutral waged war on Algonquins to the west and took 100 prisoners; the next year 170 were taken (JR, 21, p. 195). In 1642, 800 were captured. While the warriors and old men were killed, or mutilated and abandoned (JR, 27, p. 25-27), it is presumed that women and children were adopted. The frequency of Algonquian type shell-tempered pottery is very high in sites to the north of Grimsby, which suggests that captive women were brought to the eastern portions of Neutral territory[11].

War refugees also passed through or stayed in Neutralia. The core Neutral areas became first a refuge for Wenro allies from the south, who were attacked by the Seneca in 1638. Six hundred refugees, especially women and children, passed through Neutral territory (JR, 17, p. 27), many of them dying on the way since they brought disease with them (JR, 15, p. 159).

11. Lennox, Fitzgerald, 1990, p. 418-419; Finlayson, 1998, p. 30. Feathers (2006) points out many uncertainties in the apparent increase of shell-tempered pottery in the Late Prehistoric period and Michelaki (2007) asks interesting questions surrounding the occurrence of shell-tempered pottery in Neutral sites.

Others were still in Neutral land in 1641 (JR, 21, p. 231), although three hundred warriors and their families were in Huronia in 1643 (JR, 26, p. 273). The Seneca continued to attack villages east of the Niagara River (see *e.g.* Pendergast, 1994) and later still, Huron and Petun fled to Neutralia, as we will see.

Famine

Besides war, there was famine. The lives of the Neutral were not always easier than those of their more northerly neighbours. In a letter from environmentally more marginal Huronia, dated 27 April 1639, it is reported that "The famine this year is rather serious; but it is worse in the Neutral nation, where the children are sold like slaves in order to procure corn" (JR, 15, p. 157). In the spring of 1640, it was stated that Neutral men, women and children fled starving to the Petun, where many died (JR, 20, p. 47, 49). In 1643, the Jesuits recorded general famine, not just among the Huron, but among all the neighbouring groups, with people subsisting on acorns and roots. This was a period of exceptionally harsh winters. In 1640, there were volcanic eruptions in Hokkaido, Japan (Komagatake) and in Ecuador (Tungurahua), followed in 1641 by that of Mt Parker in Mindanao, Philippine Islands, no doubt contributing to the devastatingly cold winters and cool summers[12].

Would famine hit women and children particularly hard, while the men were away, hunting, fishing, trading and on war parties? Were the males less likely to receive burial, having died away from home or from freezing, drowning or by violence (categories of deaths excluded from Huron ossuary pits)? Both are possible explanations for unbalanced sex ratios, and these possibilities are, in fact, suggested by what we know of the Huron ethnohistorically. However, such marked disparity of sex and age as we see at Grimsby for bead phase IIIa is not paralleled in Huron ossuaries.

Women and children refugees are the most likely explanation for the Grimsby IIIa burials. The only other explanation is that women and children were buried separately from adult males, and that the bead phases are not, in fact, completely sequential temporally, an idea explored previously (Jackes, 1996, p. 138). The method now put in place allows us to see that the combined IIIa + IIIb sample TFR of 13-14 is outside the bounds of possibility, as is the TFR of all three bead phases combined. Even if there is some overlap of bead phases so that some of the IIIa features actually belong to earlier or later phases, as suggested by Fitzgerald (1983), it is impossible to explain the middle phase of the Grimsby cemetery without proposing an influx of women and children.

Schneider (1988, p. 167) has shown that nutritional deficiencies occurred during the 1640s and that children buried in Feature 1, indeed, suffered "periods of real nutritional stress".

12. *E.g.* Lamb, 1977; Briffa *et al.*, 1998; Ruiz *et al.*, 2006. The Ecuadorian volcano would have had an effect upon the Northern Hemisphere: De Silva and Zielinski (1998) document global consequences, including three years of cold summers in Quebec, following a 1600 eruption in Peru. The effects of East Asian eruptions can be deduced from a recent Philippino eruption, see *e.g.* Lockwood (2001).

Feature 62 and Feature 1

As distinct from Features 9 and 11 which have many juveniles and very few adult males, other burials, especially Features 26, 36 and 62, have many males. Since Feature 36 is in bead phase IIIa and Feature 26 has no trade beads, it cannot be said that there is a simple correlation of age and sex breakdown with bead phases. Two features are particularly interesting – both in phase IIIb, but very different from each other – indeed, diametrically different. Fe 62, to repeat, has many males, while Feature 1 is the only undisturbed feature in the Grimsby cemetery which seems to show a "normal" demographic profile, an expected ratio of juveniles, adult males and females.

These two features group together, separate from all other members of the trade bead phase IIIb in cluster analyses (Kenyon, Fox, 1986). Each in its own quite different way is exceptional.

The Jesuits described the Neutral treatment of the dead as being even more elaborate than that of the Huron:

> *Those of the Neutral Nation carry the bodies to the burying ground only at the very latest moment possible when decomposition has rendered them insupportable; for this reason, the dead bodies often remain during the entire winter in their cabins; and, having once put them outside upon a scaffold that they may decay, they take away the bones as soon as is possible, and expose them to view, arranged here and there in their cabins, until the feast of the Dead. These objects which they have before their eyes, renewing continually the feeling of their losses, cause them frequently to cry out and to make most lugubrious lamentations, the whole in song…* (JR, 21, p. 199).

In contrast, the Huron took their dead to a temporary cemetery within days and left them there, until all but those who were frozen to death, who had drowned or who died by violence, as well as the very young, were taken up together for secondary burial (*e.g.* JR, 10, p. 163, 267, 269, 273).

It is quite possible that the Neutral had a greater degree of differentiation socially than the Huron and that this expressed itself also in death. The presence of a particularly important leader was recorded by the French and has led to speculation that the Neutral nation was a "chiefdom" (Le Clercq, 1881, i, p. 265; JR, 21, p. 207, 215; Noble, 1985; Jamieson, 1996) and Sagard (1939, p. 209-210) discussed the formal recognition of an individual chosen in council to embody the resurrected form of an admired person who has just died (see also Jackes, 1996). While Huron burial occurred within large burial pits in which the bones of the dead were purposefully mixed together, Neutral burial seems to have involved retention of the integrity of individual skeletons (Jackes, 1996). Delayed Neutral burial of disarticulated skeletons, defleshed without cut marks (Jackes, 1988, compare Schiess, 2002, Bodin, 2002, discussing an eastern Huron ossuary dated ~1550), suggests quite a long period of exposure, as described in the quotation. And, since the bodies were reasonably well maintained as individuals, there does seem to have been particular care taken of the skeletons. The most dramatic instance of this, within a group burial, is Feature 62 at Grimsby.

Feature 62, from the last decade of the Neutral Nation, contained 103 individuals and illustrates highly ritualized burial practices. Most skulls were laid within the oval formed by a rampart of bundled long bones, and individuals were arranged by status, age, sex and disabilities. Family groupings are suggested (Jackes, 1988; 1996).

The social differentiation apparent from Feature 62, and the possible symbolism of the arrangement as interpreted by Kenyon (1979; 1982), make the idea that Feature 62 represents the dead, over one winter, of one small community very problematic. And yet this would be the implication of Kenyon's (1982, p. 231) assumption of a once-every-summer burial ritual.

In 1640-41, the Jesuits estimated that the villages they entered had around 300 people each. For a village of 300 to lose 103, most of them adults, many of them senior and important people, would be devastating. The 30 years of Grimsby cemetery use would, indeed, imply a village of not much over 300 people for the 373 dead (by one method of estimating the population from which a skeletal sample is drawn [$e_{0\text{-}5}$*(total N/30)+3] – the formula is derived, slightly altered, from Acsádi, Nemeskéri, 1970). Since there is an obvious under-representation of infants and young children this cannot be accurate, but experimentally increasing the numbers of dead infants does not markedly increase the estimated population size.

In fact, if 103 individuals represent the dead of only one year, the population size from which they were drawn would be estimated at nearly 3400. Feature 62 cannot represent the dead of one huge settlement in one year because the area has been lived in and intensively farmed by Europeans since 1784: Grimsby and its surrounding countryside is very well-known, and there is no record of anything but a thin scatter of Neutral material of the period. For this reason, it also seems unlikely that the burial represents the dead of many years from one reasonably large village. Furthermore, a lengthy period of many years before burial seems unlikely, especially since the Neutral did not leave their dead in cemeteries while awaiting the grand ceremonial of a mass burial, as amongst the Huron.

If the dead were not buried every year and the 103 represent the dead of more than one year we must consider the possibility that the dead were collected from many communities and carried to Grimsby as a special burial place. As there is no known village in the vicinity, and because of the time depth, it has been proposed (Kenyon, Fox, 1986) that the cemetery relates to a ceremonial centre, rather than to a village as such. Given that there are very specific signs of family relationships among the dead (Jackes, 1988; 1996), it seems unlikely that the dead would have been carried from disparate areas over great distances to be placed in the Grimsby cemetery. The way down through the thick growths of pine, oak and hickory which then grew along the steep escarpment would have been difficult, especially as one Feature 62 individual must have been given a primary, in-flesh burial, and there were large numbers of grave goods.

Although some grave goods in the cemetery as a whole are indicative of unusual materials brought from outside, Kenyon and Fox (1986, p. 68) state that most projectile points in the cemetery are made on local Ancaster chert. Lennox and Fitzgerald (1990, p. 420) note that Ancaster chert is not the most common in Neutral sites generally and was not the highest

quality available to Neutral flint knappers, but it is easy to work (Long, 2004). The suggestion is, then, of people using the local quarry and resident for at least some time at Grimsby.

The remaining possibility is thus of an aggregation of people through special circumstances, with the dead lost through devastating events, close in time, perhaps a combination of disease and famine. Nevertheless, the postulated events left participants in the ceremony for the dead able to carry through a complex ritual, with family members surviving and able to identify the bones. Note again that the skeletons were without cut marks, indicating that a certain length of exposure time is necessary to account for the degree of disarticulation.

Feature 62 provides evidence of a society undergoing great disruption through the almost simultaneous loss of many individuals, members of specific families, disabled people, older adult males, individuals of status. These people were apparently grouped together during a time of increased mortality. Had they, in fact, come together in an area that provided sanctuary?

It should be emphasized that the situation illustrated by Feature 62 is not one of total social breakdown. Such breakdown was vividly described by a Jesuit, when he wrote of the Huron on 13 March 1650:

> *Doubtless the teeth of the starving man make no distinction in food, and do not recognize in the dead body him who a little before was called, until he died, father, son, or brother. Nay, more, even the dung of man or beast is not spared. Fortunate are they who can eat the food of swine, – bitter acorns, and husks* (JR, 35, p. 21, see also p. 89).

The Huron were brought to such a state by famine exacerbated by disease and by war. An indication that the Neutral may have come to fear the same fate, and perhaps suffer something close to it, is provided by Feature 1 at Grimsby.

More than 17 individuals were buried in Feature 1 (the minimum number of individuals count was based on innominates). Although the excavators described "discrete bundles", all individuals were probably incomplete. Two lacked skulls, and there were several bundles containing extra arms or legs, as well as much "stray" bone. Feet and hands were lacking: they were missing even in some of the single burials at the site, probably due to the Neutral practice of delayed primary burial. But the individuals in Feature 1 are generally more incomplete and mixed than elsewhere in the cemetery. The Fe 1/33 bundle, mentioned above, provides an illustration of the confused disarray of the grave. Most of the bones belonged to one male, but fragments of a child and isolated elements of at least two other adults were included. Some of the fragments of the male had been buried at a lower level than the main portion of the bundle, but they could be reconstructed and thus had been broken before burial. This suggests that burial was delayed longer than usual, that skeletons were scattered and mixed in a period before burial, and that interment was a hurried affair without the normal care and ceremony.

If the bead phase IIIa features appear to suggest an influx of people, especially women and children, whether captives or refugees, bead phase IIIb – representing the last period of the use of the Grimsby cemetery – seems to indicate high mortality and social disruption.

Again, refugees may be the part of the explanation of this aggregation of people in a specific, and perhaps special, centre.

Certainly, the northern neighbours of the Neutral were beginning to flood into Neutralia. In 1647, 1649 and 1650, Huron and Petun survivors of war and famine fled to Neutral villages. For example, in the spring of 1649 "a goodly number" of the Huron took refuge with the Neutral (JR, 35, p. 79)[13].

The Neutral disappear from history

For the most part, the Neutral had been protected from war by their neutrality, which extended to combatants visiting their territory, so that Neutral territory provided a type of sanctuary. Sagard (1939, p. 158) recorded that both Huron and Iroquois must respect the neutrality of the Neutral lands to the extent that, if Huron and Iroquois met in Neutralia, "they did not dare to utter or do anything displeasing to one another when there, and often would even eat together as if they had been friends".

Despite this, in 1647, the northern Neutral were attacked by the Seneca. The Neutral had welcomed 300 Seneca warriors into their village. Trusting that the pact of neutrality and safety would be maintained, they took the Seneca into their longhouses and prepared food. But the Seneca proceeded to a massacre. Many Neutral were killed and many taken captive (JR, 33, p. 81). This act was in revenge for an incident of the previous winter (JR, 33, p. 83), when a Seneca who had committed murder was followed by Huron into a Neutral village and was captured before he had a chance to enter the sanctuary of a longhouse. The Seneca chose to view this as a breaking of the commitment to neutrality, presumably by the Neutral as well as by the Huron.

The next incident was the rescue by the Neutral of a Huron girl who had escaped from the Seneca (JR, 33, p. 95). This was used by the Seneca as an excuse for a final break with the tradition of neutrality.

Our knowledge of the end of the Neutral Nation is limited, because the Jesuits were forced to flee from Ontario. Events unfolded as follows. In March 1649, as described in volume 34 of the *Jesuit Relations*, the well-armed Iroquois fell in force upon the Huron. They killed the old, the sick and the very young. Of the others, they captured as many as possible. Many villages were abandoned and some Huron fled to the village of the Jesuits at Ste Marie, where there were some stone buildings and firearms. But the famine at that time was the worst known, and eventually the Jesuits decided in August 1649 to burn their village and escape to an island. The cannibalizing of the dead, dug from their graves, described above, arose from the 1649 famine. The famine lasted into 1650, and was described as extreme and prevailing over all regions (JR, 34, p. 183). In March 1650, the cannibalism of the dead conti-

13. I do not, however, suggest that Grimsby skeletons with analyzable dentitions are largely Huron/Petun. Analyses of non-metric dental traits distinguish the analyzable Grimsby teeth from, for example, those of the Huron buried at Maurice (Jackes, 1988). The cranial non-metric trait frequencies are different from other Ontario sites, suggesting a heterogeneous sample.

nued and at the same time the Iroquois struck again. The Jesuits decided to retreat to Quebec in June 1650, with all the French laymen and several hundred Huron converts. As they passed through Huronia, Paul Ragueneau described the Huron thus ".. they are a people wiped off the face of the earth" (JR, 35, p. 205, *c'est un peuple effacé de dessus la terre*).

The Huron and soon the Petun being destroyed, and the remnants having taken refuge among the Neutral (*e.g.* JR, 42, p. 235; 45, p. 243), the Mohawk now joined the Seneca in a concerted effort to destroy the Neutral.

In April 1651, news was received in Quebec that during the previous autumn 1500 Iroquois had destroyed a Neutral village. But the Neutral, helped by Huron refugees, had captured or killed 200 Iroquois. During the winter, 1200 Iroquois had invaded Neutral territory to avenge that defeat (JR, 36, p. 119).

In September 1651 Huron brought the news to the French settlements that the Neutral Nation was defeated. An account was given of the destruction of a village in the early spring of 1651 as follows:

> *Great was the carnage, especially among the old people and the children, who would not have been able to follow the Iroquois to their country. The number of captives was exceedingly large, especially of young women, whom they reserve, in order to keep up the population of their own villages. This loss was very great, and entailed the complete ruin and desolation of the Neutral nation; the inhabitants of their other villages, which were more distant from the enemy, took fright; abandoned their houses, their property, and their country; and condemned themselves to voluntary exile, to escape still further from the fury and cruelty of the conquerors. Famine pursues these poor fugitives everywhere, and compels them to scatter through the woods and over the more remote lakes and rivers, to find some relief from the misery that keeps pace with them and causes them to die* (JR, 36, p. 177).

Apart from the single report of 800 Neutral near Detroit in the winter of 1652 (JR, 38, p. 181), the Neutral disappear from recorded history as a nation. The name is further mentioned only in regard to captives: a girl among the Seneca (JR, 41, p. 103); among the Onondagas in the 1650s (JR, 44, p. 41); among the Iroquois in 1659 (JR, 45, p. 207); a Neutral slave in 1671 (JR, 56, p. 51)[14] ; a village made up entirely of captives, mostly Huron and Neutral, among the Seneca in the late 1660s and 1670s (JR, 54, p. 81, 85)[15].

Conclusion : "…where they then inhabited is now become a Wilderness"[16]

The concatenation of circumstances surrounding a population which had not had high fertility in the first place led to the complete destruction of the Ontario Iroquoians. Cultural disruption, disease, famine and years of severe weather would have been sufficient to begin

14. See Starna and Watkins (1991) for a discussion on whether the use of the term "slave" by the Jesuits is justified.
15. See Garrad *et al.* (2003) for further discussion.
16. Quoted by Brandão, 1997, p. 90.

population decline. Intensifying war, with many killed, taken captive or forced to become refugees, led to almost complete population collapse.

We have no reason to enter into the thorny field of debating the whys and wherefores of what happened in Iroquoian Ontario from 1642 to 1651. The basic facts seem indisputable and the Jesuit ethnohistorical record of them cannot be dismissed as self-serving and untruthful. Within those ten years, the Huron and Petun societies were destroyed, and many took refuge with the Neutral. The Iroquois then turned their attention to the Neutral.

The demography of the Grimsby cemetery seemed originally to suggest very high fertility. However, the methods developed since the first analyses enable us to understand how the Grimsby cemetery does not contradict, but in fact fits with the ethnohistorical records in the *Jesuit Relations*.

During the 1630s, perhaps into the early 1640s, the cemetery at Grimsby seems to have been dominated by two large multiple graves which contained a disproportionate number of women and children. It is not possible that this would represent a normal biological population. The best interpretation is that Grimsby was a place of refuge, especially for women and children.

The last period of Grimsby was a time of many deaths. Feature 62 is characterized by the number of older people, by the burial together of groups of individuals who have skeletal traits suggesting familial relationships, by many adult males. Feature 62 represents the last Neutral ceremonial burial. Again, the best interpretation of the feature is of an aggregation of individuals in circumstances leading to members of the same families succumbing to death within a limited period of time. A possibility is the gathering of people into a sheltered area close to the lakeshore where food might have been available at a time of famine. Among these there could have been some Huron and Petun refugees as well as Neutral.

Feature 1 displays no such ritualized burial. It appears to be the hasty collection of bones left broken and weathered, of incomplete and mixed individuals. Feature 1 was the last burial of the Neutral, apparently lacking the reverence for the dead which the Jesuits said characterized the Neutral. This would have occurred in 1651 during the final Iroquois onslaught, when it is recorded that the Neutral fled into the woods and dispersed for the last time. The panic flight was induced by the knowledge of what had happened to their Huron and Petun neighbours, their cruel destruction by the Iroquois. The years of famine and disease no doubt contributed to the rout of what had been a strong, populous and war-like nation.

Grimsby still presents a mystery, but one which is perhaps best understood in terms of its special location. A core area containing phase II beads represents a small area of burials, with, beyond this, burials of many women and children. Several elements are unusual among these burials, Feature 11, especially, containing an aberrant mix of beads. Beyond again, there lies a spread of many burial features, the majority identified as belonging to bead phase IIIb. There appears to be an increasing number of burial features and an increasing number of individuals buried, through a time of disease, famine and war, and through space, spreading east along the escarpment from the waterfall gorge.

We can envisage that the location had significance and that it was a place of refuge, that the dead do not represent a normal – demographically valid – population. This can be deduced from the biological and ethnohistorical impossibility that the fertility estimates based on the cemetery could be correct.

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