The Ways to Dusty Death: Three Projects Involving the Recently Emeritus Professor Michael W. Spence

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This article summarizes the results of three of several studies in which Michael Spence has assisted D.R. Poulton & Associates Inc. in his capacity as forensic anthropologist. The projects in question spanned the period from 2001 to 2006. They included the analysis of human remains recovered from a small but diverse range of sites in southern Ontario: the Springbrook site in Brampton; the Public Burying Ground in Guelph; and Victoria Park in London. It is a mark of the indispensable role Mike played in the investigation of these sites that the other authors had no choice but to take the unusual step of including him as a co-author of an article written in honour of Mike himself.

The Springbrook Site (AjGw-359)

The oldest site considered in this article is the Springbrook site. It was discovered in November 2003, during the course of a pedestrian survey of a proposed residential subdivision. The Springbrook site is a pre-contact Iroquoian habitation 1.03 hectares in size (D.R. Poulton & Associates 2005, 2006a).

The site is located on the west edge of the City of Brampton, two kilometres east of the Credit River, on one of its tributaries, Springbrook Creek (Figure 1). This site was situated on the frontier between two contemporary Iroquoian tribal confederacies; the Attawandaron, also known as the Neutral; and the Huron-Petun.

A larger pre-contact Iroquoian village site is located approximately one kilometre from the Springbrook site and both sites occupy a pocket of Oneida clay loam in an area that otherwise consists of heavier Chinguacousy clay loam soils. In the 1840s a white pine stand was located between the two sites. It probably represented the successional growth on the abandoned Iroquoian corn fields related to one or both sites.

The Springbrook site is situated in an open field with no protection from the elements, and no defensive slopes. Artifacts from this site included the usual range of material, among them pottery vessels, ceramic pipes and bone tools, and chipped and rough and ground stone. The artifact analysis indicates that the site falls within the period 1450-1500 A.D. That date range is supported by a single calibrated radiocarbon date of 1470 ± 50 A.D., which was taken from carbonized corn recovered from Level 3 of

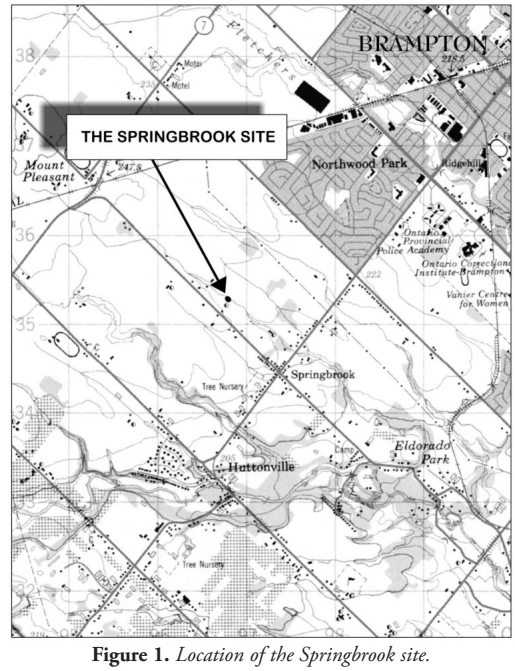

Figure 1. *Location of the Springbrook site.*

Feature 30 in the longhouse designated House 2. Feature 30 was the only semi-subterranean sweat bath at the Springbrook site. However, the site also has several post mould clusters, which Tyyska (1972) and many later researchers have interpreted as the remains of above-ground sweat baths.

Controlled surface collections of the Springbrook site were conducted in the fall of 2003 and the spring of 2004. The spring 2004 investigations also included manual test excavations of one-metre units, as well as the excavation of a series of test trenches using a Gradall under archaeological supervision. A total salvage excavation of the site followed in the fall of 2004. The limits of excavation and the archaeological investigations are illustrated in Figure 2.

The salvage excavations confirmed the presence of eight well-defined longhouses and a probable ninth house; no palisade was present. Longhouse lengths ranged from 27 to 57 metres with an average of 35 metres, a dimension typical for this time period; longhouse widths at the site ranged from 6.8 to 8.3 metres with an average of 8.01 metres, a dimension wider than average for this time period (Dodd 1984:263).

There were comparatively few cultural features at the Springbrook site and that applies to both the

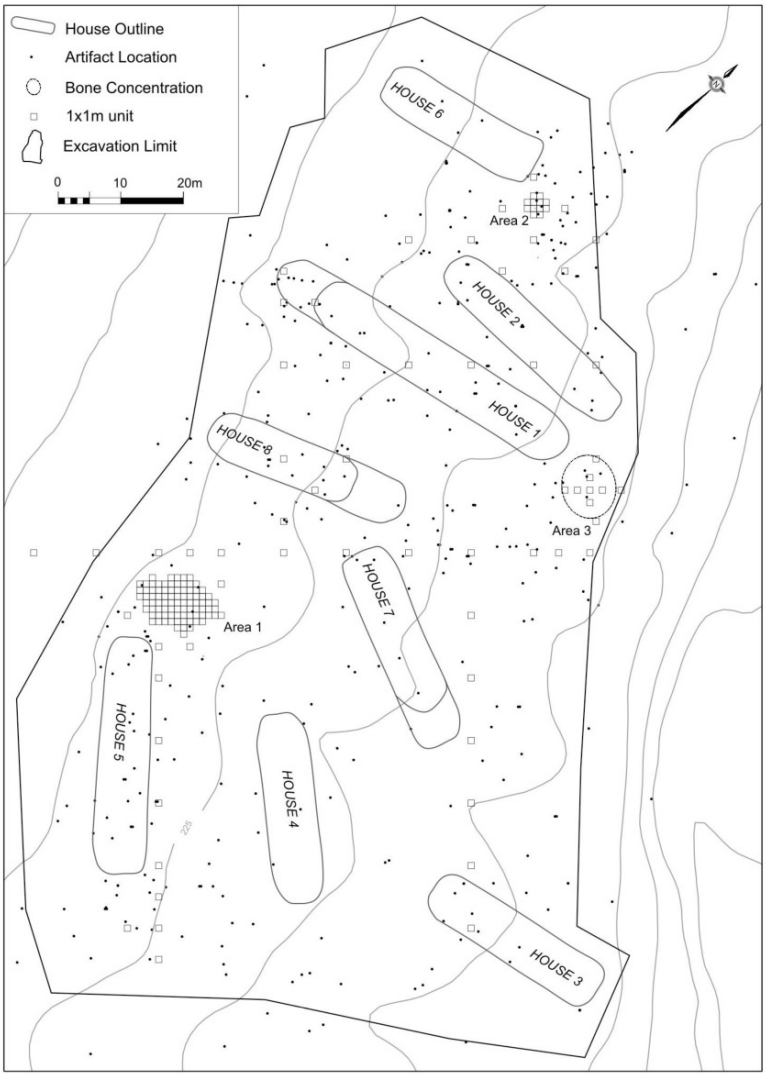

Figure 2. *The Springbrook site: Stage 3 investigations & Stage 4 block excavations.*

longhouse interiors and the areas between the houses. The relative lack of subsurface cultural remains may be a factor of the relatively heavy nature of the Oneida clay loam subsoil.

No rich middens were present at this site, but block excavations were carried out on three deposits (Figure 2). One, designated Area 1, proved to be a midden associated with the north end of House 5. Another block excavation, designated Area 2, proved to be a small refuse deposit associated with the south end of House 6. The third focus of manual excavations was Area 3; it consisted of a ploughzone concentration of fragments of calcined bone.

The excavations of the Springbrook site revealed no evidence of overlapping houses. Rather, the houses are generally widely-spaced and follow two basic orientations; these factors indicate a level of community planning. House extensions are present on four of the structures: Houses 1, 4, 7 and 8, suggesting that the occupation of the site spanned some period of time. Despite the fact that this site covers an area large enough to be a village, several factors call into question the function of the site. One is the lack of major midden deposits. A related factor is that the two controlled surface collections only totalled 244 stations, which is a very small number of plotted items for a village site of this size.

There are several possible explanations for the fact that the Springbrook site is relatively large but not particularly rich. All of these possible explanations relate to the size of the population, the length of the occupation and/or the function of the site. One possibility is that the site may not have been a village but was a less substantial settlement, such as a hamlet that was occupied by fewer people for a shorter time. Another possibility is that the site does indeed represent a village, but that for some reason it was not occupied for an extended period of time. A related possibility is that the site began as a hamlet and was in the process of evolving into a village, but for some reason was abandoned before it could be fully developed. Unfortunately, the artifact samples from the different houses, and from the large village site located nearby, are too small to evaluate these alternative hypotheses.

There were only two finds of human bone at this site, and their presence demonstrates a ritual element to the occupation of the site. The occurrences were associated with adjacent longhouses (Figure 3), and both are rather enigmatic. One find was a calvarium from Feature 30, the semi-subterranean sweat lodge in House 2. This feature was the one that produced the radiocarbon date of 1470 A.D.

Although poorly preserved, it is clear that the element consisted of only the frontal, occipital and both parietals; the temporals, facial area and cranial base were not present. There were no cut-marks or indications of trauma. Suture closure indicates an age of 40-50 years at death (Meindl and Lovejoy 1985: Table 3). The smoothness of the nuchal area and external occipital protuberance suggests a female, as do the superior orbital margin shape, supraorbital ridges, and parietal bossing. However, none of these are strongly diagnostic features, so sex is probably best identified as "female (?)." An attempt by Molecular World Inc. to determine sex through DNA was unsuccessful. The context of this find suggests that it had been either stored in the sweat lodge or suspended from its roof.

If the calvarium is indeed from a woman, it would have important implications for Ontario Iroquoian social practice. It has been suggested that sweats were integrative rituals, particularly for the men who, in a matrilocal and matrilineal society, would presumably have had diverse social origins. However, the presence of a female "relic" in a sweat lodge would suggest instead that women played a central role in the sweat bath ritual. Perhaps relevant here is the discovery of a full female skeleton in a semi-subterranean sweat lodge in one of two twin villages that constitute the Middle Ontario Iroquoian Dorchester site near London, Ontario (Holly Martelle, personal communication to Dana Poulton, November 26, 2007).

The second find of human remains at the Springbrook site occurred in the ploughzone deposit designated Area 3 and in the underlying ploughzone-subsoil interface designated Feature 31. The context is not altogether clear, but this deposit may have been situated within an open-

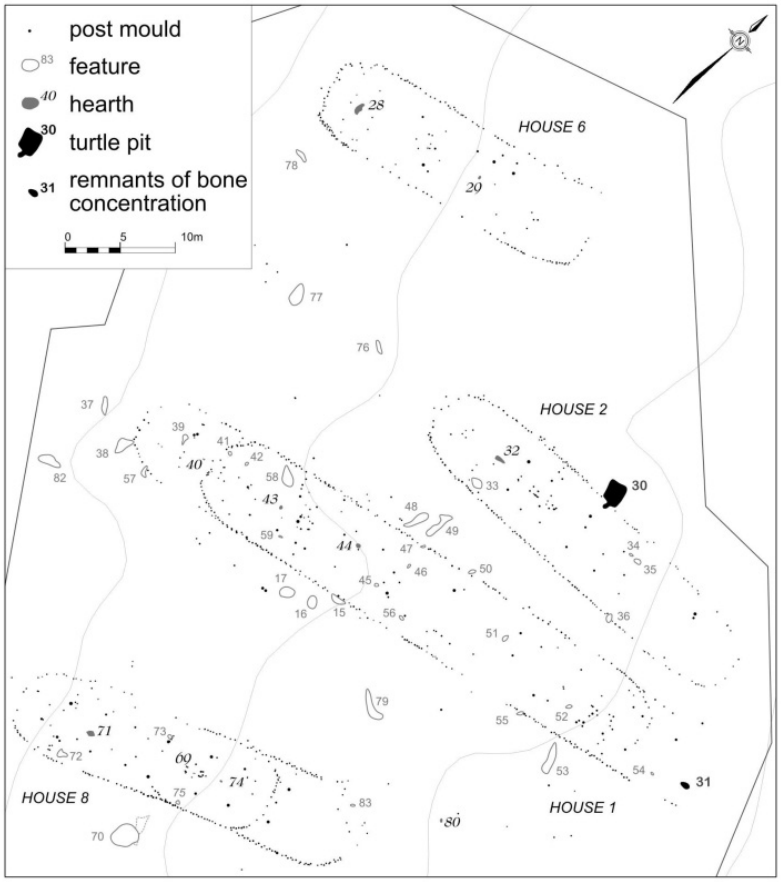

Figure 3. *Settlement patterns in the north half of the Springbrook site.*

ended southern extension of House 1, the longest longhouse on the site (Figure 3). The excavations of this feature and the overlying ploughzone recovered 6,999 specimens, 99% of which consisted of small fragments of burned and calcined bone. This occurrence was clearly not a typical refuse deposit.

Most of the bone was too fragmented for analysis, but 37 bone and dental elements could be identified as human. Four individuals were represented: an infant, probably a neonate; a child of 5-10 years; a young adult male, whose lack of sutural fusion places him in the late teens or early twenties; and a second adult of unknown age and sex. The neonate is represented only by cranial elements and the child by cranial and mandibular fragments. Both adults have cranial and mandibular elements present, and there also are a number of adult postcranial fragments that cannot be assigned to a specific individual. These include vertebra, rib, ulna, radius, tibia, fibula, patella, navicular, and pedal phalanx pieces. Fragments of two non-human mandibles were also recovered from this deposit: one was fox; the other could only be identified as Carnivora sp.

The most likely explanation for these remains is that they represent a formal cremation. The cremation evidently took place elsewhere, and the bones deposited here represent only a selection of those cremated, with an emphasis on cranial elements but with a good number of adult postcranial elements also included.

We know of nothing comparable to this deposit from other Ontario Iroquoian sites. Multiple cremation burials are not known for Ontario Iroquoian sites, although they do occur in contemporaneous Wolf phase sites in the southwestern corner of Ontario. Also, the inclusion of burned non-human bone in the deposit is unexpected. Perhaps some unusual situation

forced the people of Springbrook to depart from their normal mortuary practices.

The Public Burying Ground (AjHb-71)

The second project considered in this article involved the partial salvage excavation of the Public Burying Ground in the City of Guelph (Figure 4). The cemetery was established by the Canada Company on April 23rd, 1827, the same day that Guelph was founded by John Galt, the Superintendent of the Canada Company. Used for the interment of those who were non-Anglican, non-Catholic or had no religion, this cemetery was an important feature in the cultural landscape of early Guelph (Figure 5).

The use of the cemetery spanned a 26-year period, from April 1827 to December 1853, when the Town of Guelph passed a by-law prohibiting any further burials within the Town limits. Curiously, although the land use of the property changed after 1853, it continued to be depicted as the Public Burying Ground for more than half a century.

The cemetery was formally closed by an Order-in-Council of the Ontario Legislature in 1879. A new by-law that year established a public park on the former cemetery. In the decades following 1853 many burials and headstones were moved to the New Union Cemetery (now Woodlawn Memorial Park), located outside the limits of Guelph, and more burials were moved after the creation of the new park.

Chapter 88, the 1879 Act of the Statutes of Ontario, which concerned the purchase of the old burying ground, states that "many persons living in the neighbourhood of the said parcel are, and have for a long time past been, improperly making use of the same for their private purposes." The 1872 *Bird's Eye View of Guelph* provides the earliest visual record of the property in the decade leading up to the creation of the park. It shows that several small one-storey structures, possibly squatters' homes, were located on the property. In addition, the north end of the property appears to have been lightly forested. Most important, the property is depicted as having a rolling topography. That had significant implications for the potential for extant graves within the old Public Burying Ground.

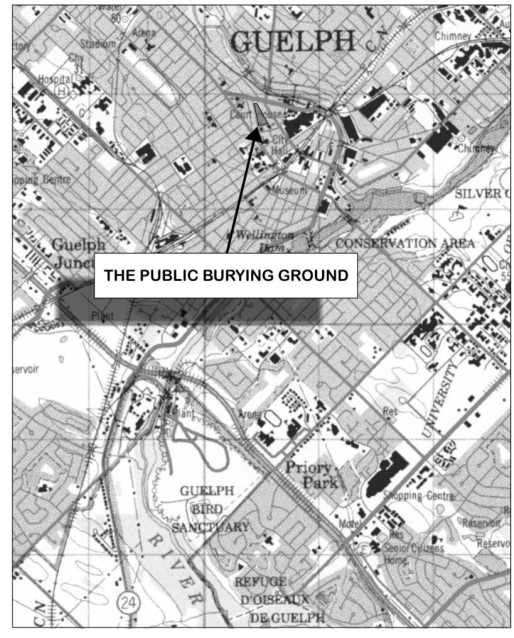

Figure 4. *Location of the Public Burying Ground, City of Guelph.*

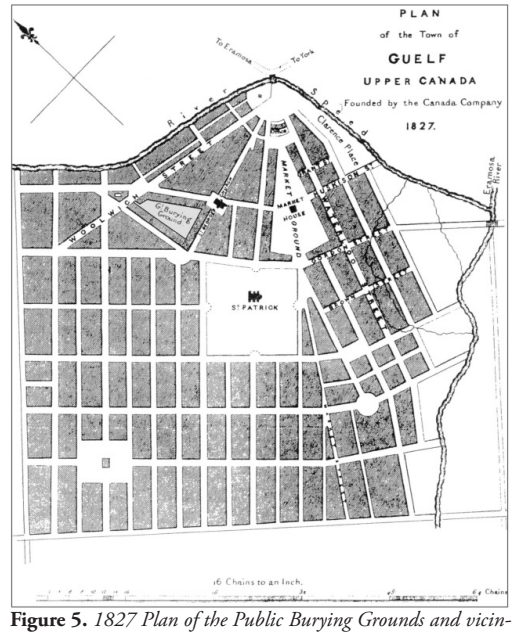

Figure 5. *1827 Plan of the Public Burying Grounds and vicinity.*

By the time the property became public park in 1879, 26 years had passed since the last burial

had taken place there – a period as long as the use of the cemetery itself. The park lasted a dozen or so years, until 1892, when the City sold part of the property to the Royal Curling Club (later the Guelph Curling and Skating Rink Company). The club constructed a large two and a half storey brick structure in the southern portion of the former cemetery. Named the Victoria Rink, it was used for curling and ice skating in the winter and for roller skating in the summer. The building covered a surface area of 0.14 hectares – just over a third of an acre - and was bounded to the north and east by bowling greens. About 1900 a factory complex, the three storey high Cream Separator Factory, was built in the west-central portion of the former cemetery, north of the Victoria Rink. It changed names and functions a number of times during the early to mid 20th century. These buildings are clearly visible in the 1946 aerial photograph illustrated as Figure 6. Sometime after 1960 all of these structures were demolished and the property was paved for use as a municipal parking lot. That use continues to this day.

In October 2005 a human burial was discovered by a City works crew repairing a sink hole in Baker Street and the City of Guelph contracted D.R. Poulton & Associates Inc. to investigate the discovery. The initial investigation here in 2005 also led to the investigation of a second grave in another sink hole only 10 metres up Baker Street (D.R. Poulton & Associates 2006b).

In the summer of 2006 the City of Guelph contracted the firm to conduct a much more extensive salvage excavation of the adjacent Baker Street parking lot, which had been selected as the site of a proposed multi-story parking facility. The 2006 excavations mitigated a 0.41-hectare area of the former Public Burying Ground (D.R. Poulton & Associates 2007). Figures 7 and 8 show a view of the Baker Street parking lot looking south and a detail of the results of the 2006 excavations.

As with most 19th century cemeteries in southern Ontario, the available records on the Public Burying Ground in Guelph are very limited. There is some documentation on who was later disinterred for reburial elsewhere but no overall record of who was buried there, or of where they were buried within the cemetery. Nor do any monuments survive within the cemetery. Finally, the cemetery is too early for there to have been coffin plates. In consequence of all of these factors, none of the individuals represented by the skeletal remains recovered by the archaeological investigations can be identified by name.

Including all categories of human bone, the portions of the Public Burying Ground excavated in 2005-2006 contained the complete or partial remains of 45 individuals - 22 adults, two teenagers, and at least nine children and 10 infants. Figure 9 illustrates the distribution of the human remains and burial features excavated in 2005 and 2006 relative to the buildings depicted in the 1960 Fire Insurance plan.

There is considerable variability in the nature and distribution of the human skeletal material

Figure 6. *1946 aerial photograph of the Baker Street property.*

Figure 7. *The Baker Street parking lot, view to south.*

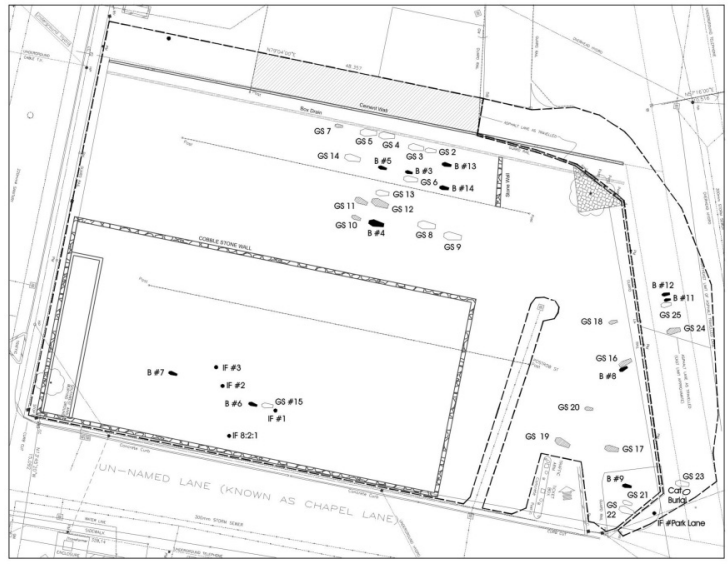

Figure 8. *Detail of the 2006 Baker Street excavations.*

recovered from the Public Burying Ground (Spence 2006a, 2006b, 2006c, 2007a, 2007b). To provide some structure to this complex picture, the finds were assigned to five categories: Summary data on the remains are presented in Table 1.

The 2006 excavations confirmed the presence of grave shafts, intact burials and isolated finds of human bone in three discrete clusters within and immediately east of the southern part of the existing parking lot. Despite this distribution pattern, it is clear that the division of the burials into three discrete clusters is an artificial one. Without doubt, other burials were originally present in the intervening areas, but they were destroyed by later grading and construction. What we have left are, in effect, islands of surviving graves within a fairly extensive sea of disturbance.

One of the clusters is located in the north-central portion of the excavations. It had five intact burials and 13 exhumed grave shafts, for a total of 18 graves. This cluster is located within the former bowling green that was situated north of the Victoria Rink. The second cluster of bur-

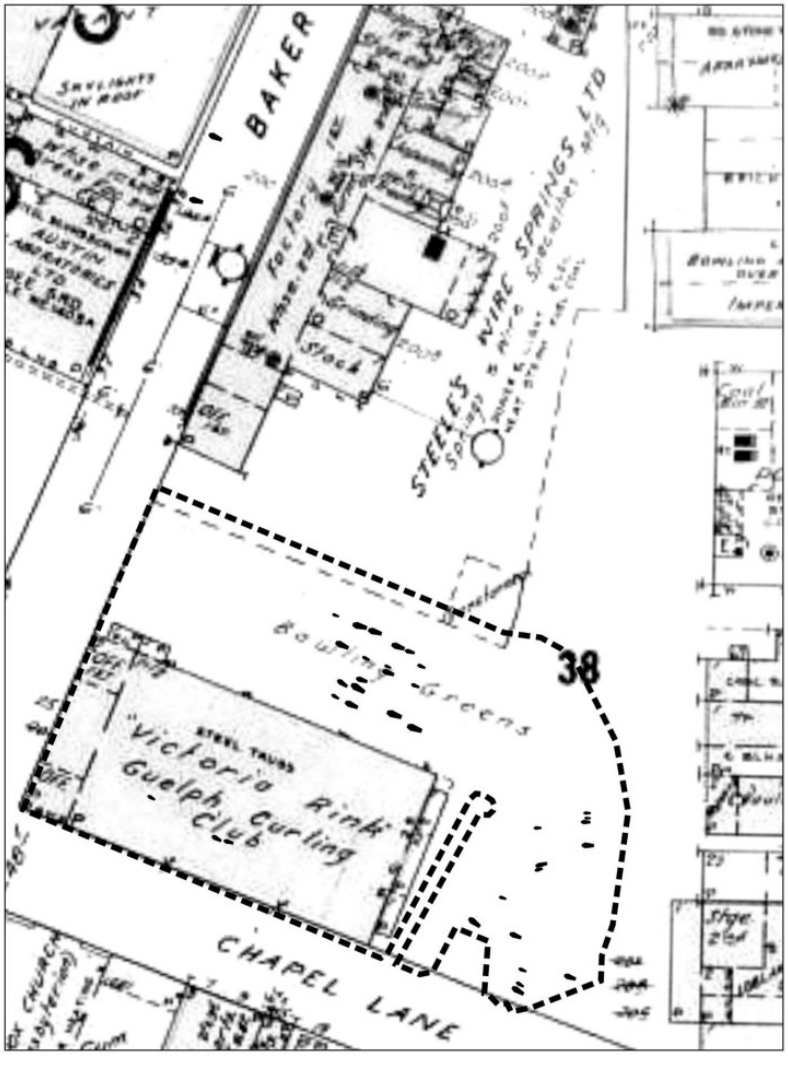

Figure 9. *1960 fire insurance map showing the limits of excavation and location of burials.*

Table 1. *Cemetery age patterns.**

Categories	Age Increments				
	Adult	Infant	Child	Sub-adult Total	Youth
unexhumed burials (B)	4	7	2	9	0
exhumed (GS with bones)	6	2	5	7	0
exhumed (GS with no bones)	6	?	?	2	0
F series	5	0	1	1	2
S series	1	1	1	2	0

ials is located in the southeast corner of the existing parking lot and the adjacent Park Lane right-of-way. It had four intact burials and 10 exhumed grave shafts, for a total of 14 graves. This cluster is located within the former bowling green that was situated east of the Victoria Rink.

The third cluster of human remains is located in the southern part of the existing parking lot, within the original footprint of the Victoria Rink. This cluster had one intact burial, one reburial and one exhumed grave shaft, as well as four separate occurrences of isolated human

bone. The reburial and the isolated human bones in this area both related to graves that had been disturbed during the construction of the Victoria Rink in 1892.

"Burials" (B series) are burials that had never been formally exhumed. There are 13 individuals in this category, four adults and nine sub-adults (Table 1). One of the adult burials (B6) was situated within the footprint of the Victoria Rink. It actually consisted of a collection of disarticulated bones that had been placed in an irregular pit. The elements present included all of the long bones, six vertebrae, the sacrum, 12 ribs, scapulae and innominates, one patella, one clavicle and 29 of the small bones of the extremities. Missing are a few of the mid-sized bones, most of the bones of the extremities and, more conspicuously, the cranium and mandible. These remains relate to a burial believed to have been disturbed during the construction of the Victoria Rink in 1892 and hastily reburied by the construction workers in an informal pit. Despite its displacement, then, B6 does belong in the Burial category; it was a burial and had not been formally exhumed. However, the absence of the cranium and mandible is puzzling. The other major bones were recovered, and it seems very unlikely that these two were simply overlooked. The most plausible explanation is that they were deliberately withheld from the reburial, perhaps for presentation or sale to somebody. They may have ended up gracing a doctor's office or somebody's curio cabinet.

"Grave Shafts" (GS series) are the shafts of burials that had been formally exhumed for removal to another cemetery. This process started in the mid 1850s and continued into the mid 1890s, well after the formal closure of the Public Burying Ground in 1879. There are 24 of these shafts. In thirteen of them some bones were recovered. These are mostly small bones that had separated during decomposition and would easily have been missed by those doing the exhumations. They allow a general age assessment of the people who had been buried there: six adults and seven sub-adults.

The other eleven shafts produced no bones, so age assessment in those cases required a different approach. Length measurements of the shafts offered some evidence, working on the assumption (probably not too outrageous) that the gravediggers would not have dug a grave larger than necessary. Shaft lengths for graves known to have contained adults, either unexhumed burials or exhumed burials with some bone remnants, range from 176 to 241 cm, with a mean of 206.1 cm (n=7). Those for known sub-adults have a range of 80-192 cm, with a mean of 124.5 cm (n=15). It is probably safe to assume that shafts 140 cm or less in length held sub-adults while those over 192 cm held adults. Following these guidelines, the eleven empty shafts would have contained six adults, two sub-adults and three of indeterminate age (shafts 140-192 cm in length may have held older children, adolescents or adults). These figures can be added to the counts for incompletely exhumed graves. The total by age category for exhumed burials then becomes twelve adults and nine sub-adults, plus three of unknown age.

The designation "Isolated Findspot" (IF series), also abbreviated to "Findspot," refers to isolated bones or small clusters of disarticulated bones dispersed through the site fill. They are not in prepared pits, but rather seem to have been simply displaced or discarded where found. There are eight such finds, with five adults, one infant of three months, and two teenagers (one of 15-19 years and one of 13-16 years). They may have been elements overlooked or discarded during exhumations, or scattered during accidental intrusions into intact burials. The latter may be the more likely explanation in most cases. Some of these finds (and also B6, described above) were beneath the location of the Victoria Arena, and may represent formerly intact burials that were displaced and scattered during its construction in 1892. Furthermore, most of the bones recovered from the Findspots are large elements rather than the small ones that are often left behind during exhumations. Elements recovered from exhumed graves include four cranial elements (all unfused sub-adult segments), 27 vertebrae, 19 ribs, four pelvic elements, 15 long bones and 154 extremity elements. In contrast the Findspots produced three pelvic segments, 16 long bones and only one extremity element.

The designation "Surface" (S series) refers to occurrences that consist of one or a few isolated bones found in monitoring the heavy equipment used to excavate the site. They were recovered from the hatched area depicted in Figure 8. It is impossible to say what their original proveniences may have been. There are only three such finds. They consist of both femora of an infant of about one year (S1), a humerus and both tibiae of a child of about six years and an adult patella.

Sex was assessed for the adult skeletons through a variety of methods, though primacy was assigned to pelvic features (Buikstra and Ubelaker 1994; Phenice 1969). Age assessments were based largely on the auricular surface of the ilium (Lovejoy et al. 1985), the sternal rib ends (İşcan et al.1984) and pubic symphysis morphology (Suchey and Katz 1998). Sub-adult age assessment relied on both dental and skeletal development (Baker et al. 2005; Fazekas and Kósa 1978; Moorrees et al. 1963a, 1963b; Saunders and Spence 1986; Scheuer and Black 2000).

As a cemetery series, the Public Burying Ground individuals do not offer a fully reliable picture of health in 19th century Guelph. They do, however, give us some insight into the challenges that faced people then. Most would have suffered as they aged from dental infection (caries and abscesses) and arthritis. B1, for example, is an adult male of about 40-45 years. He shows antemortem loss of six molars, abscesses at two sites, and caries in one molar and two premolars. A number of B1's bones show some arthritis, most notably in the vertebral column where *spondylitis deformans*, a form of degenerative arthritis, appears in the lower thoracic and lumbar vertebrae. Also affecting the vertebral column is diffuse idiopathic skeletal hyperostosis (DISH), a more generalized disease (Schwartz 1995:243-244). Thoracic vertebrae 5 through 12 are involved, with fusion between T7 and T8 and T9 through T12 (Figure 10). The DISH is also expressed in osteophytes in the calcanei and innominates and in the fusion of the left innominate and sacrum at a point posterior to the auricular surface, as well as in excess ossification from the first rib, manubrium and xiphoid process (Spence 2006a). The second and third cervical vertebrae are fused (Figure 11); that is a result of

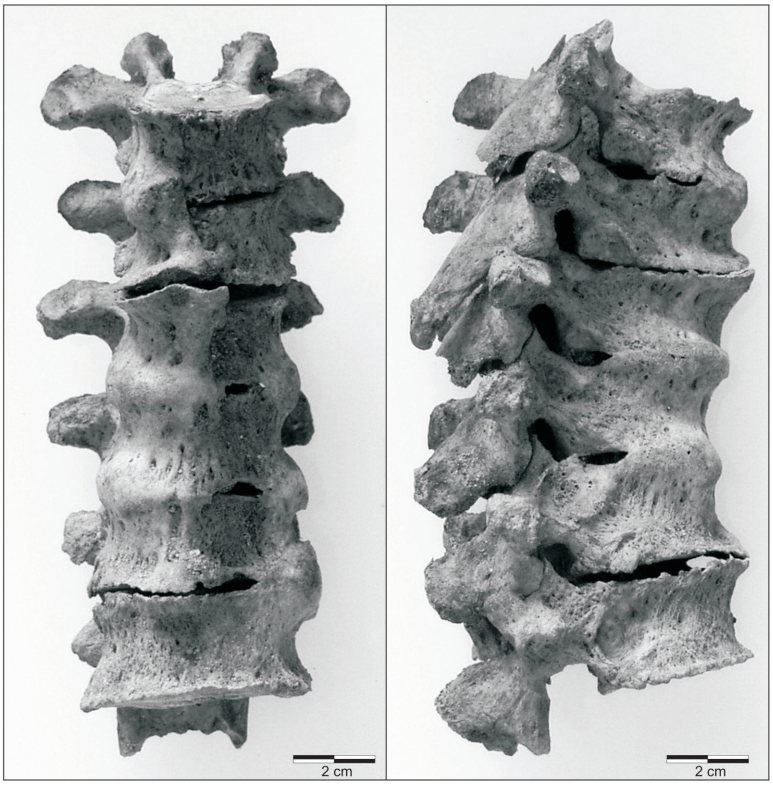

Figure 10. *Fused thoracic vertebrae.*

Klippel-Feil syndrome of the type II variety (Barnes 1994:67-69).

Trauma was responsible for a number of other lesions on B1's skeleton. There is a deposit of well integrated new bone on the distal left tibia, probably the result of localized trauma there. A healed fracture of the right fourth rib, near the neck, could have been from a fall or a blow. In addition, the nasal septum had been broken, healing at an angle (Figure 12). Finally there is a "boxer's fracture" of the right fifth metacarpal (Figure 13). The bone healed but with misalignment and the development of long spurs into the soft tissue (myositis ossificans). All of these traumatic events could conceivably have been part of a single episode, though there is no evidence for this. `Certainly the deviated septum and the boxer's fracture are the sorts of injury that can be expected in a fist fight. However, this does not mean that B1 had been a regular barroom brawler. A boxer's fracture occurs when an improperly held fist absorbs the shock of a blow on the unsupported fourth or fifth knuckles (Galloway 1999:155-156). An experienced fighter knows enough to avoid this sort of fracture, delivering the blow with the fist aligned with the forearm, the force landing on the second and third knuckles and then being dissipated through the supporting forearm.

B4, a male of about 45-50 years, has antemortem loss of at least five teeth and caries in another seven. There are no active abscesses, but the inferior part of the right mastoid process has been destroyed by an infection that likely originated in the maxillary right first and second molars, two of the teeth lost antemortem. Like B1, B4 suffered a number of back problems. One unusual feature is the presence of a thirteenth thoracic vertebra and thirteen sets of ribs. There are five lumbar vertebrae, as expected, and the thirteenth thoracic has no lumbar features. A supernumerary vertebra frequently leads to back pain. Unfortunately, B4 had still other back troubles. His fifth lumbar vertebra shows spondylolysis or the bilateral separation of the neural arch from the body.

This condition is usually considered to be an indication of stress that occurred in youth or the earlier adult years. There is no indication of spondylolisthesis, an associated condition involving anterior slippage of the vertebral body, but it is not always manifest in the vertebrae. The arch of the first sacral body has not fused at the midline, a case of spina bifida occulta. Spina bifida occulta in the sacrum is often thought to be associated with lumbar spondylolysis, though the evidence

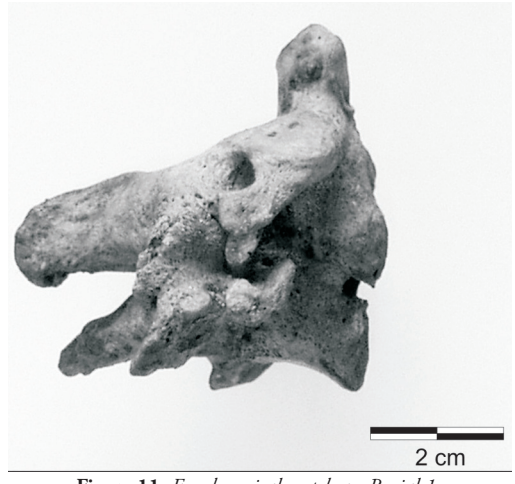

Figure 11. *Fused cervical vertebrae, Burial 1.*

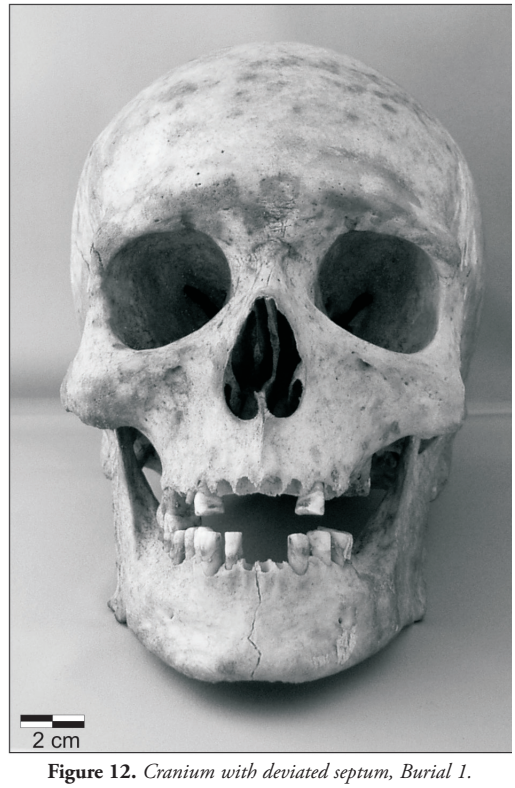

Figure 12. *Cranium with deviated septum, Burial 1.*

Figure 13. *5th meta-carpal with boxer's fracture, Burial 1.*

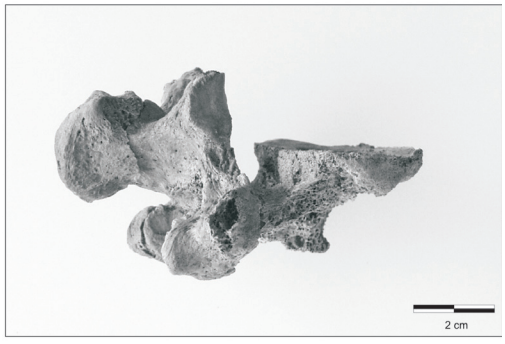

Figure 14. *Lateral view of 13th thoracic vertebrae, Burial 4.*

Figure 15. *Femora with pronounced tubercles of bone, Burial 4.*

for this is not conclusive (Mays 2006). There are also Schmorl's nodes on several lower thoracic and lumber vertebrae. These pits in the surface of the vertebral body generally reflect protrusions of the intervertebral disc, a frequent result of carrying heavy loads in childhood or adolescence.

By far the most serious problem for B4, however, was the spinal tuberculosis that had destroyed part of his lower vertebral column. The bodies of the thirteenth thoracic through second lumbar vertebrae had been extensively damaged (Figure 14). The infection also involved some segments of the pedicles and transverse processes, and was probably responsible for the macroporosity and new bone deposition on ribs ten through thirteen.

The infection was apparently of considerable duration. The vertebral arches of the thirteenth thoracic and first lumbar, when properly articulated, show that the thoracic had tilted forward and down, into the space that would normally have been occupied by the body of the first lumbar. This kyphosis is a frequent feature of spinal tuberculosis (Ortner and Putschar 1985:148-149). The fact that the neural arches had remodelled to adapt to this anterior angulation of the spine shows that B4 had suffered it for some years.

Both femora of B4 have pronounced tubercles of bone on the posterior surface, just above the medial part of the condyle (Figure 15). The medial head of the Gastrocnemius muscle attaches at this point. The Gastrocnemius runs down the back of the lower leg and flexes the leg, drawing the lower leg up or pulling it back. The kyphosis of B4's spine would have bent his body sharply forward, and his mobility would have been severely limited. It is possible that he needed a conveyance like a Bath-chair to get around. Named for its use with invalids at the hot springs of Bath in the West Country of England, this is essentially a chair with wheels at the base of each leg, propelled either by someone pushing from behind or by using one's own legs to "walk" it. That set of movements could well have been responsible for the bony outgrowths on the backs of the femora.

The left condylar neck of B4's mandible is shortened, setting the condyle considerably lower than its counterpart on the right (Figure 16). Its articular surface is flattened and rough. These features are probably the result of a childhood fracture that impeded later growth. This is the most frequent site of mandibular fractures in children (Galloway 1999:78).

Figure 16. *Posterior view of mandible with shortened left condylar neck, Burial 4.*

B6 is a female of about 40-44 years. Disturbed and then casually redeposited in an irregular pit, with the cranium and mandible missing, B6 offers only limited evidence of health, trauma and activity patterns. Of interest, however, are the semicircular articulation facets on the palmar surfaces of some of the proximal hand phalanges. These palmar facets were present bilaterally on digits 2-4 but absent on digit 5. When the proximal and middle phalanges of digits 2-4 are articulated in full flexion, with the middle phalanx contacting the palmar facet, the angle between the middle and proximal phalanges is 60º. This sort of sharp contraction is referred to as "claw-hand." It appears with leprosy (Molto 2002:180, Figure 4), but B6 shows none of the other characteristics of leprosy. Even the affected phalanges and adjoining bones are otherwise normal. An alternative explanation is that the facets reflect some particular activity. This activity would have involved repeated use of both hands in a tightly flexed position, with the principal point of flexion located at the first in-terphalangeal joint. When using a washboard, a laundress grips the clothes in tightly flexed hands. This activity also requires repeated and forceful extension of the forearm, a function of the Triceps brachii muscle. The attachment site for the medial head of this muscle on B6's humerus is sharply defined, suggesting vigorous use.

The Guelph sub-adults were apparently subject to trauma on occasion. The mandibular fracture of B4, which led to his shorter left ramus, had evidently occurred in childhood, although we cannot say at what age or from what cause. B13, a child of 4-5 years at death, has a depressed fracture on the exterior postero-lateral surface of the right parietal bone, 30 mm in diameter. Depressed fractures in this location are likely the result of child abuse, although accident remains a possibility (Galloway 1999:68, 231-232). In the case of B13 there is no evidence of prior, healed fractures in the cranial or post-cranial skeleton, making a diagnosis of child abuse uncertain. Since there is no evidence of healing in the cranial fracture, the blow that created it probably caused B13's death.

Two surface collections from different parts of the Public Burying Ground each included a single sub-adult femur. The two femora are similar enough in size, morphology and condition to be from the same individual (S1), an infant of about one year. There is an incomplete oblique fracture on the medial side of the proximal metaphysis of the left femur; the epipyseal surface is still intact. This break is a "corner" fracture, a variant of the Salter-Harris Type 1 fracture. It is frequently associated with child abuse (Galloway 1999:231). Woven bone has formed at the site but remains poorly integrated, indicating that S1 survived the fracture by only a few weeks. This kind of trauma is associated with child abuse, more specifically damage caused by "sudden jerks or wrenching motions on the limb or from severe shaking" (Galloway 1999:231). The right femur is not complete enough for observation of this area. It is unfortunate that more of the skeleton was not recovered. It might have provided other evidence of abuse, and perhaps resolved the question of whether this episode of abuse was instrumental in the death of S1 a few weeks later.

There is some age patterning visible in the cemetery (Table 1). To interpret it, we need to examine the exhumed burials, the GS series, as well as the intact burials (B series). In many cemetery analyses the exhumed graves and the scattered bones (our F series) are not given adequate consideration. As stated previously, there are documentary records of exhumations from the Public Burying Ground, but they do

not include the data necessary for a proper analysis of the demographic profile of the exhumations. For that, we must go to the archaeological evidence.

Of the B series, four are adults and nine are sub-adults (Table 1). The majority of the latter (n=7) are infants, one year or less at death. The GS burials from which some skeletal elements were recovered include six adults and seven sub-adults, a higher proportion of adults. Also, only two of the seven sub-adults in the GS series are infants. This suggests that sub-adults, and particularly infants, were less likely than adults to be exhumed.

An eye-witness account of a visit to the Public Burying Ground is recorded in an 1853 entry in the diary of Anne Everitt (neé Thurtell). It includes a description of her family's burial plot and also notes that a stone wall had just been erected around the cemetery. The archaeological excavations by D.R. Poulton & Associates and the osteological analysis by Michael Spence did provide some evidence of the presence of family burial plots within the portion of the cemetery excavated in 2006. This is clearest in the case of the cluster of three graves in the southeast portion of the cemetery, in the Park Lane right-of-way (Figures 9-10). It included two newborns, possibly twins: B11 and B12. They were buried side-by-side, though in separate graves, and were beside GS25, an exhumed grave that had contained an older individual. The length of the latter grave shaft was in the intermediary range between the adult and sub-adult size, indicating that it may have held an adolescent (possibly a sibling) or a short adult.

Other sets of burials documented by the 2006 excavations are also located immediately beside one another, so closely spaced that a familial relationship can be assumed. One set consists of B3, an unexhumed neonate, beside GS6, an empty grave of adult size. A second consists of B8, an unexhumed infant, beside GS16, an exhumed adult male. A third consists of GS21, an exhumed infant, beside GS22, an empty grave shaft of adult size.

In three of these four sets the infants had been left behind while adjoining adults and perhaps an older sub-adult had been exhumed for reburial elsewhere. Although these seem to represent deliberate choices, and again may reflect a lower level of concern for sub-adults, particularly infants, these choices were not universal; several sub-adults, including infants, were exhumed.

There could have been many different reasons why some individuals were not exhumed for reburial elsewhere after this cemetery was closed. In the case of the intact sub-adult graves, it may be that some of them were not marked at all or at least not clearly marked and that over time people simply forgot they were there.

In the case of the unexhumed adults, there is no particular reason to suspect that they were overlooked because of low social status. In fact, some of the graves of adults and of individuals of other ages may remain intact because their surviving kin had left the region and were unaware that the cemetery had been closed. In other cases, it may be that the surviving family members just did not care enough to go to the trouble and expense of having the deceased exhumed and reburied elsewhere. This hypothesis may apply particularly to the sub-adults, as there appears to be a disproportionate number of intact sub-adult burials in the sample excavated in 2005-2006. One explanation for this apparent pattern is that in some families the remains of sub-adults and especially of infants may not have been held as near and dear as those of older family members.

Further to the above, yet another explanation for the presence of intact graves of adults and others in this cemetery is that their graves may have been overlooked because their headstones had been displaced. Possible support for this hypothesis is contained in a letter to the editor of the Guelph Advertiser dated March 2, 1854, three months after the cemetery was closed. It was from a citizen of Guelph who had contributed $10 to the more than $1200 public subscription for the construction of the stone wall built around the cemetery in 1853. In it, the writer stated that the reason the wall was built was to ensure "*that the graves of the dead might not be disturbed by horses and cattle*."

The writer of the 1854 letter was upset by the fact that the Town Council had just rented the

property to a Colonel Hewat for the sum of $5 per year. With the exception of a pasture, it is hard to image what use Hewat could have put to a cemetery that was no longer active but had not yet formally been closed. In any event, as the wall was built in the year further burials were prohibited, the Public Burying Ground had operated for a full quarter of a century without the benefit of whatever protection it afforded. The fact that the writer of the letter raised this issue at all suggests that damage to the cemetery by livestock had been a problem in the past and could be a continuing problem under Hewat's tenure. If this were true, the damage to the cemetery may have included breakage and displacement of some of the headstones by cattle and horses bumping into them or using them as scratching posts. That, in turn, provides one more reason why some graves may have been overlooked during the period when exhumations of some graves were taking place and remained intact.

Five adults, two youths and only one infant are represented in the Findspot category. If we were to assume that these finds represent material displaced from unexhumed (but disturbed) graves and add all of them to the B category, we would have totals of nine adults, ten sub-adults and two youths who had not been exhumed, versus twelve adults and nine sub-adults who had been exhumed (Table 1). These more even ratios might suggest that we should not jump to conclusions yet about the degree of concern for children expressed in the Public Burying Ground, at least not until we have a better understanding of the Findspot category.

However, the Findspot category may actually encompass a variety of different situations. One F context, for example, produced only a single adult hand phalanx, and should perhaps be treated as material discarded during an adult's exhumation rather than as material from an accidentally disturbed burial. Another F context includes material from two individuals, an adult talus and a femur, fibula and both tibiae from an infant. The context was tabulated on the basis of the more numerous infant bones, but the talus might have been displaced during the exhumation of an adult elsewhere in the vicinity. For that matter, one of the exhumed grave shafts (GS18) included not only several bones of a child on the pit floor, forming the basis for its tabulation, but also six adult wrist and hand elements higher in the shaft fill, again perhaps displaced or discarded during an adult exhumation.

The total for the excavated portion of the site, all categories considered, is 22 adults, 21 sub-adults and two youths (with perhaps two more adults if the latter two situations described above are included). The low proportion of youths is not surprising; this age category generally has low mortality. Of the 21 sub-adults, there are 19 whose ages can be determined with some precision. Grouped into categories, these include 11 infants (0-1 year), three young children (1.5-3 years) and five older children (4-8.5 years). The highest mortality, then, was in the first year of life. This category can be still further subdivided into four neonates (dying within a few weeks of birth) and seven older infants (3 months to 1 year). Neonatal deaths are generally due to what might be loosely termed internal conditions, such as genetic defects and congenital problems. Older infants are more likely to perish from environmental causes like disease and malnutrition (Saunders et al. 1995:72, 80-82).

One major hurdle in infancy is weaning. The change from mother's milk to more solid foods can lead to a variety of problems, e.g. increased exposure to infection, difficulties with digestion and less nutritional foods (Saunders et al. 1995:81-82). Historic and isotopic analyses indicate that in 19th century southern Ontario weaning had generally occurred by the age of one year (Katzenberg and Pfeiffer 1995). Weaning, then, probably played an important role in the relatively high mortality suffered by infants in the 3 months-1 year category. The other sub-adults (1-9 years of age) would have been exposed to a wide variety of health threats. Child abuse, evident in S1 and perhaps suggested in B4 and B13, may have been among them.

Information on the mode of interment for those buried in the Public Burying Ground was provided by both positive and negative evidence. B11 and B12, the two infants buried side-by-side, were both interred with shrouds secured by

copper shroud pins in the upper right chest area. They were the only shroud pins recovered by the 2005-2006 excavations.

Buttons were recovered from two of the burials. All are of shell, and all are small four-hole buttons, with diameters of about 10 mm. A single shell button was recovered from GS25, adjacent to B11 and B12. As stated earlier, it was an exhumed grave that had contained an adolescent or a short adult. Three shell buttons were recovered from B4, a man who died at 45-50 years of age. Small 19th century shell buttons of this type would typically be sewn onto the blouse of a woman or a girl. As such, the button from GS25 may not be out of place, but the buttons from B4 certainly are. The most reasonable explanation is that the buttons recovered from B4 represent accidental inclusions in the material used to fill in the grave following the interment of the adult male. For that matter, the same could apply to GS25.

Granting that the burials investigated in the course of the 2005-2006 excavations only represent a sample of the total population of those who were interred in the Public Burying Ground, the evidence to date suggests that very few of the individuals in this cemetery were buried in shrouds secured by shroud pins. Others may have been buried wrapped in winding sheets, but if so, no remains of the cloth have survived. Based on the paucity of buttons and on the nature of the graves in which they occur, few if any of the individuals appear to have been buried clothed. All things considered, the reality for most if not all of those who were interred here seems to echo Ecclesiastics 5:15: naked into this world they came, and naked they left it.

Victoria Park (AfHh-244)

Victoria Park is located in downtown London, Ontario (Figure 17) and is the oldest public park in the municipality. Dedicated by Lord Dufferin in 1874, it evolved through the late 19th and early 20th century to become the quintessential Victorian and Edwardian public park. Since 1995 D. R. Poulton & Associates have been carrying out background research and field investigations of the park as part of the Victoria Park Restoration Master Plan. Those investigations are being conducted on behalf of the City of London.

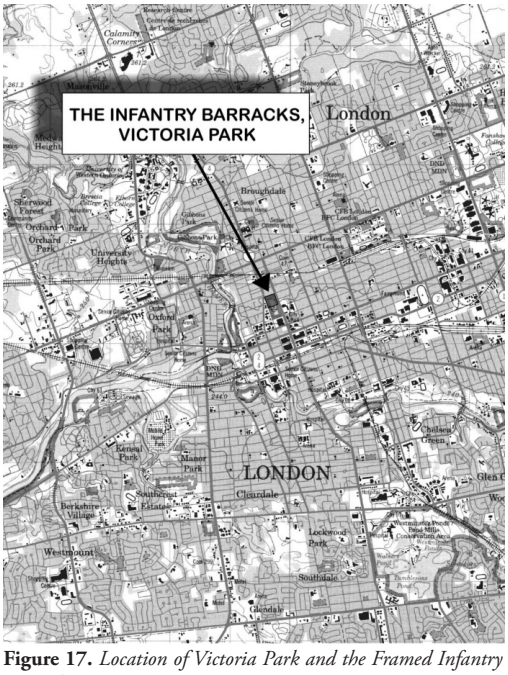

Figure 17. *Location of Victoria Park and the Framed Infantry Barracks.*

The focus of the study has been the site of one of three main barracks of the mid 19th century British Military Reserve in London: the Framed Infantry Barracks. The barracks complex was located in the west-central portion of the 73-acre British Military Reserve (Figure 18). It covered the northern 10 acres of the 15-acre park (Figure 19). The garrison in London was occupied from 1838 to 1851, when it was closed by the British as part of an empire-wide cost-cutting measure, and occupied again from 1861 to 1869. Including all ranks, the troop strength in the Framed Infantry Barracks averaged around 600 soldiers in any given year. The Framed Infantry Barracks was contained within a rectangular palisade with four bastions. Within the palisade, the parade square was flanked on four sides by several dozen buildings. They included the soldiers' quarters to the north, the officers' quarters to the south, the canteen, goal and ordnance magazine to the east, and the hospital compound to the west. The information that follows focuses on discoveries made during the

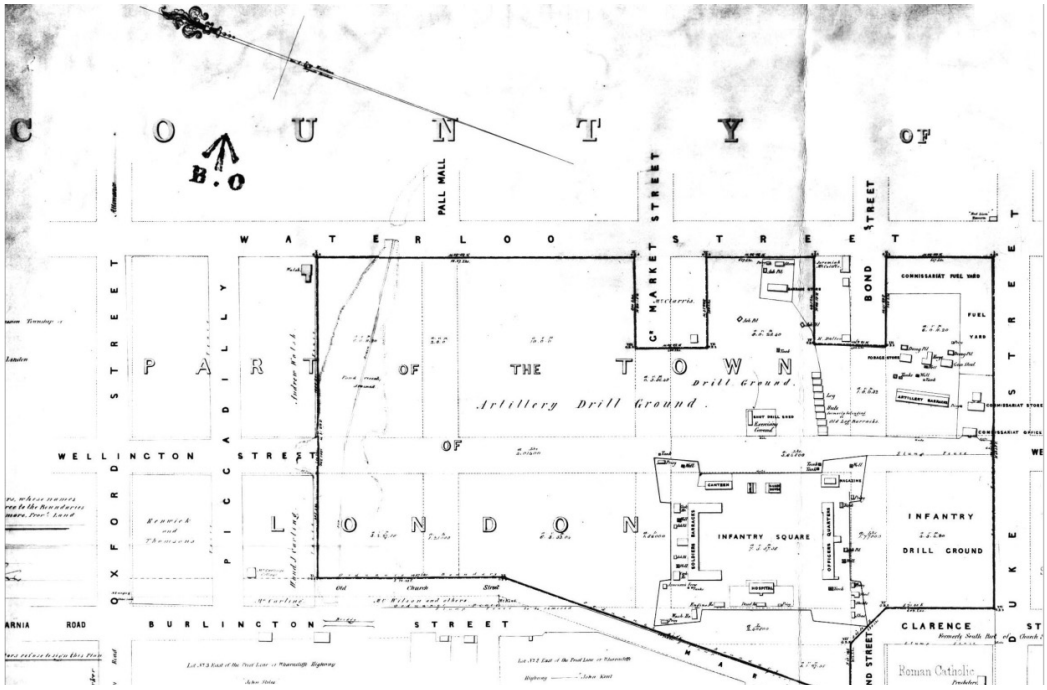

Figure 18. *1853 Plan of the British Military Reserve in London, Canada West.*

2001 and 2002 excavations within the hospital compound (D.R. Poulton & Associates 2003).

The rectangular-shaped hospital compound included the hospital itself, a well, a root cellar or ice house, a privy, a straw shed and a dead house, all surrounded by a picket; other structures were added to the north end of the compound in the 1860s. The dead house was used for storing the corpses of those who died over the winter, when frozen ground precluded burials.

The Framed Hospital was two storeys high and measured 90 feet by 40 feet, with wards for 56 patients. Figure 20 is a photograph of a portion of the Infantry Barracks taken ca. 1866, in the winter: the hospital is the building to the left, behind the gun crew; the building to the right is the west wing of the soldiers' quarters.

In 1871, two years after the garrison closed, the City took over the Framed Infantry Hospital for use as a civic hospital. Within a few years the building was sold at auction to two different buyers, sawed in half and moved on rollers a few blocks north up Richmond Street.

Limited excavations were undertaken in the hospital compound in 2001 and 2002; they recovered over 40,000 artifacts. The sample produced ample evidence of the function of the hospital compound. One unique find was a small rectangular brass rectangle, probably a key tag, stamped "SURGERY…INFANTRY BARRACKS."

Other specimens included three types of artifacts found here but nowhere else in the barracks. One consisted of glass vials. The other two consisted of two-handled bowls and galipots of white earthenware. The galipots held medicinal salves and the vials held liquid medicines. As for the two-handed bowls, further research would be necessary to confirm their function, but it seems likely they were used to feed invalids. Finally, the tablewares from the hospital compound are dominated by an enormous range of plain white tablewares. Decorated tablewares are predominant everywhere else in the barracks, and the prevalence of hospital whites in the hospital compound clearly points to a military issue of the hospital tableware service.

Other clear evidence of the function of the hospital compound came in the form of body parts from one or more amputations. Human remains were recovered from two features. One was a refuse

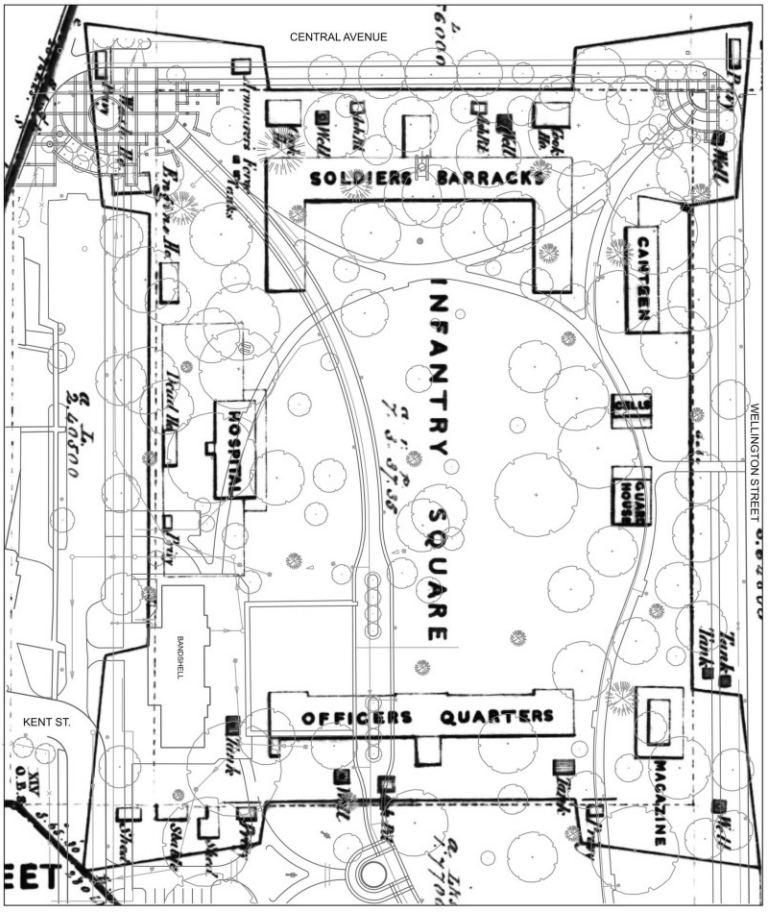

Figure 19. *Overlay of Victoria Park and the 1853 plan of the Framed Infantry Barracks.*

Figure 20. *Photograph of the Framed Infantry Barracks Hospital, ca. 1866.*

pit designated Feature 105, which contained the bones of the better part of a human foot. The other was the privy, Feature 146, which contained a fibula. As illustrated in Figure 21, the two features were located only 6.5 metres apart, and both were situated southwest of the hospital.

Feature 105 was a refuse pit. It produced 3247 specimens. Fully 77% of the material recovered from this feature - 2492 pieces in all - consisted of bone from food refuse. Feature 105 also contained 13 human bones. Analysis determined that they were contiguous elements of a right foot: the first cuneiform, metatarsals 1-5, proximal row phalanges 1-5, the distal phalanx of digit 1, and a sesamoid bone of digit 1. All epiphyses had fused, indicating a minimum age of 16 if the individual was a female or 17 if a male. There was no evidence of pathology, and no cut marks whatsoever.

It would have been virtually impossible to amputate only this portion of the foot without leaving cut marks. There must have been a period of time between the amputation and the deposition of the foot in the pit, during which the attached soft tissue had suffered extensive decom-

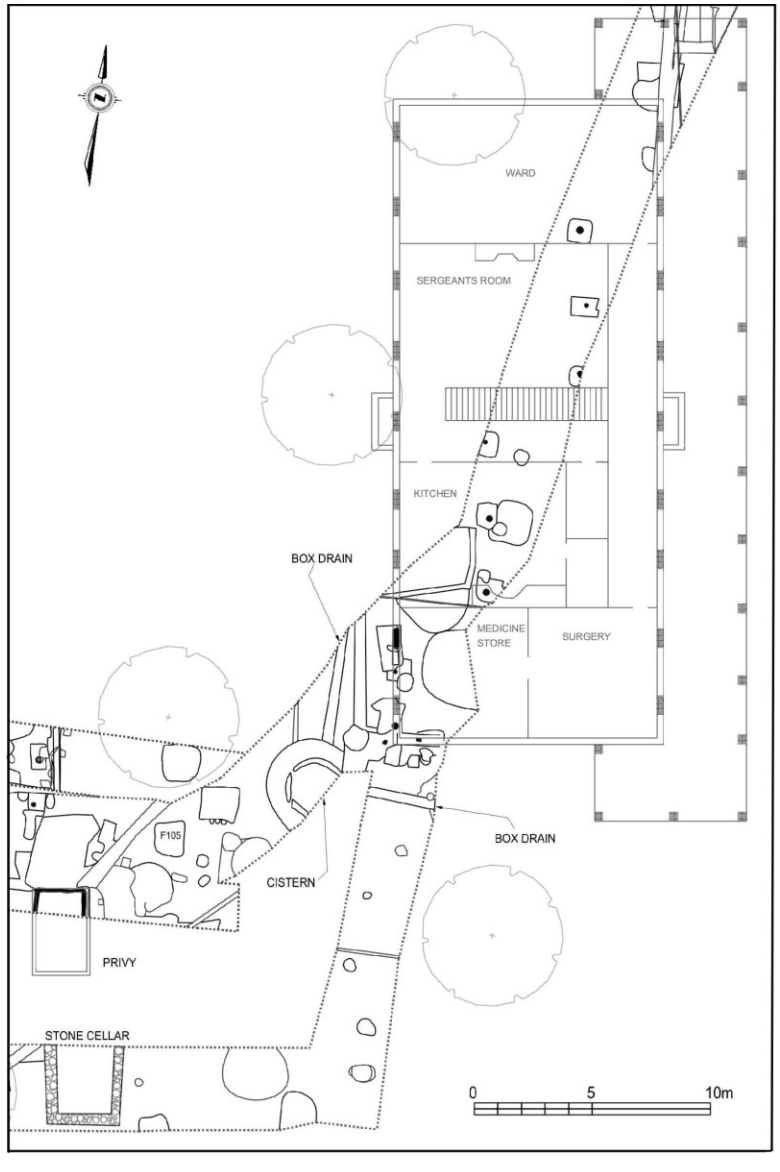

Figure 21. *Settlement patterns in the hospital compound, 2001-2002 excavations.*

position. That hypothesis would also explain the absence of most of the phalanges.

Datable artifacts from Feature 105 include military buttons of three regiments: the 32nd, which was garrisoned in London from January 1838 to July 1839; the overlapping occupation by the 73rd, which was stationed in the barracks from July 1838 to June 1840; and the 23rd Regiment, which was garrisoned here from June 1843 to May 1845, and again from May 1850 to June 1852. Also recovered from this feature was an ironstone plate of the Corn and Oats pattern with a registry date of February 21, 1863. Based on the associated remains, the Feature 105 foot amputation could date either to the reoccupation of the barracks in the 1860s or to the immediate post-barracks years of the early 1870s.

The 2002 excavations of the hospital compound included the northern third of the hospital privy. Based on contemporary plans, this privy measured 12 feet by 8 feet, and had a six-foot deep cess pit. Artifacts from the partial excavation of the privy included fragments of newsprint that had evidently been used as toilet paper. The privy also contained another case of the casual disposal of human medical waste – a right human fibula.

The leg had been amputated by a handsaw cutting from the lateral side of the leg to the medial side, with the cutting stroke pushing away from the surgeon, moving from the back to the front of the leg, and the passive stroke in the other direction (Symes et al. 1998). A month or so prior to the amputation the patient had suffered an oblique fracture of the fibula. The nature of the fracture shows that there would have been a corresponding fracture of the tibia and extensive soft tissue damage. There was some healing but it was inadequate. That, with the possible addition of infection, led to the need for the amputation.

The fibula was found in the profile of the feature, so other bones from that amputation may be present in the unexcavated portion of the privy. As this bone came from the fill layer of the privy, it dates to the abandonment and demolition of the feature. Based on that, the amputation dates either to the end of the second military occupation of the barracks by the British military in 1869; or to the brief period in the early 1870s when the Framed Hospital was used as a civic hospital. Regardless, the lower leg amputation in the privy could relate to the remains of the amputated right foot recovered from the nearby Feature 105.

Conclusions

We'll never know the full story behind the human body parts found in the hospital compound at Victoria Park. However, a London Free Press article of February 24, 1866, written three years before the British closed the London garrison, confirms that amputated body parts were not always properly disposed of in Victorian London. The article, entitled *Mysterious Circumstances*, reads as follows:

> An event which occasioned a good deal of talk in the city yesterday was the finding, early in the morning, of a Human Hand, on the ice near Westminster Bridge, and a large black Newfoundland dog standing sentry over it….At length Policeman Mawhinney was commissioned to remove it, and executed the trust with exemplary daring and fortitude. We learn that it belonged to a patient in the hospital [the Keilly Hospital, on York Street near Westminster Bridge], who underwent the process of amputation…But how it came to be in the described position is unaccountable, unless through the carelessness of the person whose duty it was to bury it (Seaborn 1944:185).

The mystery about the hand easily might have been solved had the reporter bothered to interview the person charged with disposing of it. Regardless, the three studies considered by this article clearly show that there is often an element of the unknowable in forensic anthropology.

Did the lower leg and the foot from the hospital compound in Victoria Park belong to one

person or two? Man or woman? Military or civilian? And did he or she or they survive the operation? We don't know. Is the multiple cremation at the Springbrook site really unique, what ritual or belief system does it reflect, and were the remains even those of Iroquoian peoples? We don't know. And were a disproportionate number of children and infants buried at the Public Burying Ground in Guelph really left behind when the cemetery was cleared, and if so, why? We can speculate, but we really don't know.

In part, these questions reflect the inherent limitations of the science. Ultimately, however, they also reflect the limitations of the current state of our knowledge about the life and times of the people who lived at these three sites or who, in whole or in part, were buried in them.

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