CRANIOMETRIC STUDY OF THE PARSONS CRANIA FROM MIDDEN 4/FEATURE 245

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INTRODUCTION

As noted in the settlement pattern analysis (Robertson, Williamson and Welsh, this volume), the excavations at the Parsons site resulted in the recovery of two incomplete human adult crania—one male and one female (Figure 39)—buried at the bottom of a refuse-filled depression at the base of Midden 4, which lay within the area of the eastern inner palisades (Robertson, Williamson and Welsh, this volume). Both crania were deposited in an upright position with their faces pointing east beyond the palisades. Although neither of the crania exhibited signs of cut marks indicative of scalping, cited as common Huron treatment of their war captives (Jamieson 1983), the unusual location of these crania raised the question of whether they represented individuals who were captives of war or foreigners who were not accorded "traditional" burial rites. Craniometry was deemed to be the best available approach for exploring this question. Measurements from the two Parsons crania were compared to measurements from crania representing four other aboriginal groups which were known to have contact with the region through trade and/or warfare.

MATERIAL AND METHODS

The archaeological sites used in the comparison are the Uxbridge Ossuary, the Kleinburg Ossuary, the Roebuck site and the Boughton Hill site. The Uxbridge and Kleinburg ossuaries were chosen for their close, physical and temporal, proximity to the Parsons site. The Roebuck and Boughton Hill sites were

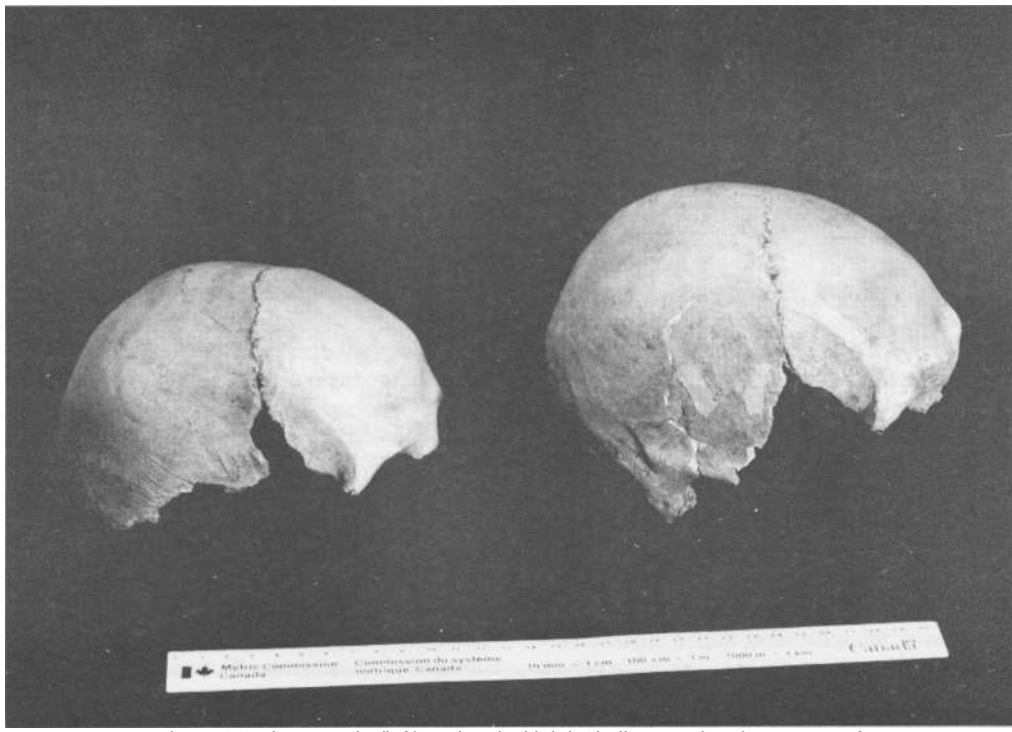

Figure 39. The Female (left) and Male (right) Skulls Found at the Bottom of Midden 4 Along the Innermost Eastern Palisades.

chosen because they represent the remains of groups who lived sufficiently far away to be considered "foreign" to the region (Figure 40).

The Uxbridge Ossuary, located in Uxbridge Township in Durham Region, represents a Late Iroquoian population in the Rouge watershed and has been radiocarbon dated to A.D. 1490±80 (Molto 1983; Pfeiffer 1983). For the purposes of this study 34 crania (15 male, 19 female) from the Uxbridge Ossuary were measured by the authors.

The Kleinburg Ossuary was located near the Humber River, in Vaughan Township, York County, east of the town of Kleinburg (Molto 1983). A date of circa A.D. 1585-1615 has been suggested based on the iron axes and other European trade goods found at the site (F.J. Melbye, personal communication 1995). All craniometric data for the Kleinburg Ossuary was collected by Melbye, including the 47 individuals (19 male, 28 female) used in this study.

The Roebuck site is located in Augusta Township, Grenville County, approximately 14 km north of the St. Lawrence River (Molto 1983). Based on its constituent artifact assemblages, Roebuck is regarded as a late pre-contact St. Lawrence Iroquoian village dating to *circa* 1450-1530 (Pendergast 1975; Ramsden 1977). Sixteen crania (seven male, nine female) from this site were measured by the authors during the course of the present analysis.

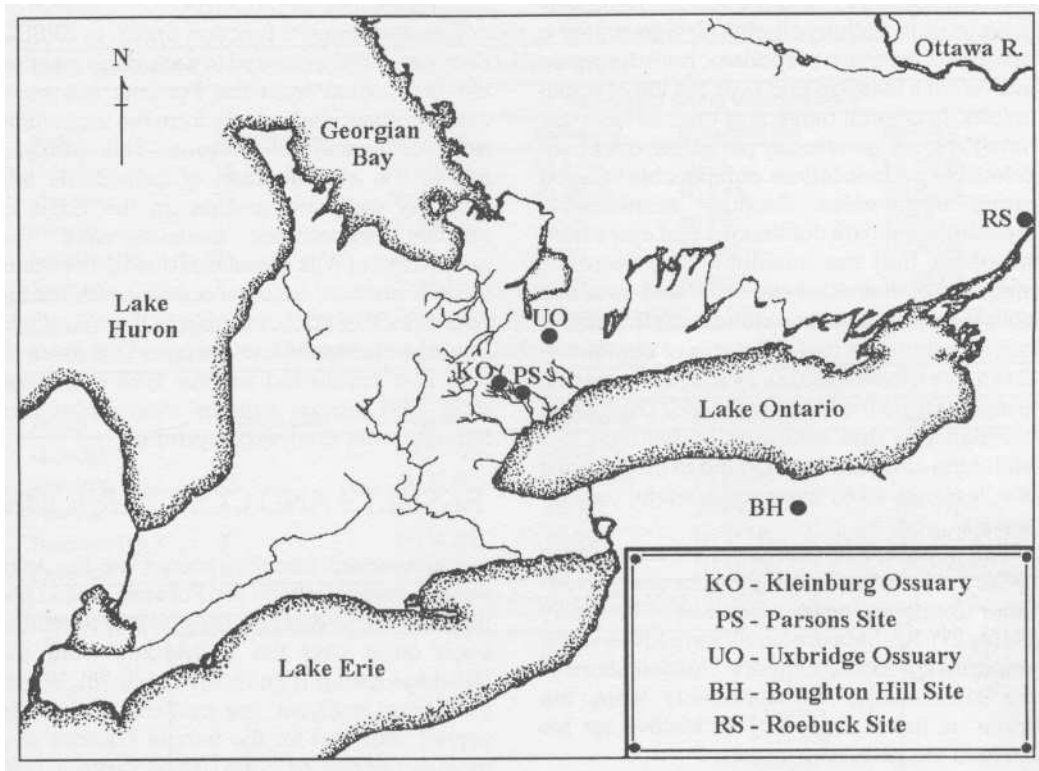

Figure 40. Location of the Five Late Woodland Populations Used in the Craniometric Analysis.

The Boughton Hill Site is located in the Genesee Valley region of Upper New York State. The site is estimated to have been occupied circa A.D. 1670-1687 and is thus historic or post-contact (Sublett 1966). Twelve crania (five male, seven female) from Boughton Hill were measured by T. L. Varney.

The same criteria for the determination of sex were used by all observers (Jerry Melbye, personal communication 1995; Tamara Varney, personal communication 1995). Multiple morphological observations, independently observed trait by trait, were taken for each crania using the standardized morphological traits for sex determination found in Steele and Bramblett (1988) and Bass (1987). The sex

represented by the most traits was assigned to the cranium. The crania in which sex was indeterminable were excluded from the study.

The objective of this study was to determine which Late Woodland population the Parsons crania most closely resembled: the local Uxbridge and/or Kleinburg groups or the more distant Roebuck and/or Boughton Hill groups.

Craniometry allows an exactness and reproducibility in measurement considerably greater than anthropometry. Crania reflect a number of adaptive responses, both during an individual's lifespan and over the life of populations. Important aspects of cranial form are thought to be genetically persistent over considerable periods of time, comparable to blood group frequencies. Because craniometric measurements are continuous and correlated variables, they are amenable to parametric methods of statistical analysis, and thus are able to furnish objective statements in population comparisons and estimates of population distances (Howells 1973). This is not to say that craniometry is the ideal method for population comparisons and estimates of distance, but under the circumstances found at the Parsons site, it allows us to draw some useful conclusions.

Ten standard craniometric variables were collected from the Parsons crania and the four other aboriginal groups included in the study (Table 77). All measurements were taken using standard spreading calipers. The definitions of the craniometric measurements were the same as those used by F. J. Melbye for his study of the Kleinburg crania.

Table 77. Craniometric Variables and Corresponding Abbreviations used in this Study.

Craniometric Variables	Abbreviations used in text
Maximum Cranial Length	GOLEN
Maximum Cranial	MAXCB
Basion-Bregma Height	BBHT
Basion-Nasion Length	BNLEN
Minimum Frontal Breadth	MINFB
Biasterionic Breadth	BIAB
Bistephanic Breadth	BISB
Nasion-Basion Chord	NBCH
Basion-Lambda Chord	BLCH
Lambda-Opisthion Chord	LOCH

To control for inter-observer error, comparisons were made between measurements taken on test crania by the two authors. It was found that the test measurements were never more than 1 mm different between the two observers, and in most cases the measurements were identical. The landmarks to be used in the measurements were identified and agreed upon by both observers in a further effort to limit inter-observer error. Finally, identical calipers were used by the authors when taking the measurements in order to minimize experimental error.

The discriminant function option in SPSS-X (Norusis, 1988) was used to determine whether the two crania from the Parsons site more closely resembled groups from the immediate area or surrounding areas. This analysis allows the classification of individuals into mutually exclusive groups on the basis of specific craniometric measurements. The generation of Wilk's lambda (U-statistic) within the discriminant function analysis reveals the importance of each variable in the classification of individuals into groups. The analysis was first conducted on the total combined male and female sample, then males and females were analyzed separately.

RESULTS AND CONCLUSIONS

Discriminant function scores for the total sample reveal that the two Parsons crania are not individually distinct. They closely resemble each other and the individuals from the Uxbridge group (Figure 41, Table 78). Within the group analysis, the probability that the scores achieved for the female Parsons cranium would belong to the Uxbridge group is 87 percent, while the probability that the female would belong to the next closest group, the Kleinburg group, is 24 percent. The discriminant scores for the male Parsons cranium display a probability of 77 percent that it belongs to the Uxbridge group, and a probability of 25 percent that it belongs to the closest next group, Kleinburg.

Discriminant analysis for males alone reveals the same pattern as the total group analysis. The male Parsons cranium falls within the Uxbridge and Kleinburg groups (Figure 42). The cranium is classified as belonging to the Uxbridge group (Table 79), with a probability of 89 percent that the discriminant scores would be grouped with the Uxbridge scores. The second closest group is Kleinburg (19 percent probability).

Table 78. Discriminant Analysis Classification Results for Each Group with Males and Females Grouped Together.

		Predicted Group Membership			
Group	**Sample Size**	**Uxbridge**	**Kleinburg**	Boughton Hill	**Roebuck**
Uxbridge	34	(24) 70.6%	(4) 11.8%	(3) 8.8%	(3) 8.8%
Kleinburg	47	(10) 21.3%	(19) 40.4%	(9) 19.1%	(9) 19.1%
Parsons	2	(2) 100%	(0) 0%	(0) 0%	(0) 0%
Boughton Hill	12	(1) 8.3%	(1) 8.3%	(8) 66.7%	(2) 16.7%
Roebuck	16	(1) 6.3%	(0) 0%	(2) 12.5%	(13) 81.3%

Percent of "grouped" cases correctly classified : 57.66%

Table 79. Males Only, Discriminant Analysis Classification.

		Predicted Group Membership			
Group	**Sample Size**	**Uxbridge**	**Kleinburg**	**Boughton** Hill	Roebuck
Uxbridge	15	(11) 73.3%	(1) 6.7%	(0) 0%	(3) 20.0%
Kleinburg	19	(6) 31.6%	(9) 47.4%	(1) 5.3%	(3) 15.8%
Parsons	1	(1) 100%	(0) 0%	(0) 0%	(0) 0%
Boughton Hill	5	(0) 0%	(0) 0%	(4) 80.0%	(1) 20.0%
Roebuck	7	(1) 14.3%	(0) 0%	(0) 0%	(6) 85.7%

Percent of "grouped" cases correctly classified: 63.83%

Table 80. Females Only, Discriminant Analysis Classification.

		Predicted Group Membership			
Group	**Sample Size**	**Uxbridge**	Kleinburg	Boughton Hill	**Roebuck**
Uxbridge	19	(11) 57.9%	(4) 21.1%	(3) 15.8%	(1) 5.3%
Kleinburg	28	(5) 17.9%	(10) 35.7%	(7) 25.0%	(6) 21.4%
Parsons	1	(1) 100%	(0) 0%	(0) 0%	(0) 0%
Boughton Hill	7	(1) 14.3%	(0) 0%	(4) 57.1%	(2) 28.6%
Roebuck	9	(0) 0%	(0) 0%	(1) 11.1%	(8) 88.9%

Percent of "grouped" cases correctly classified : 51.56%

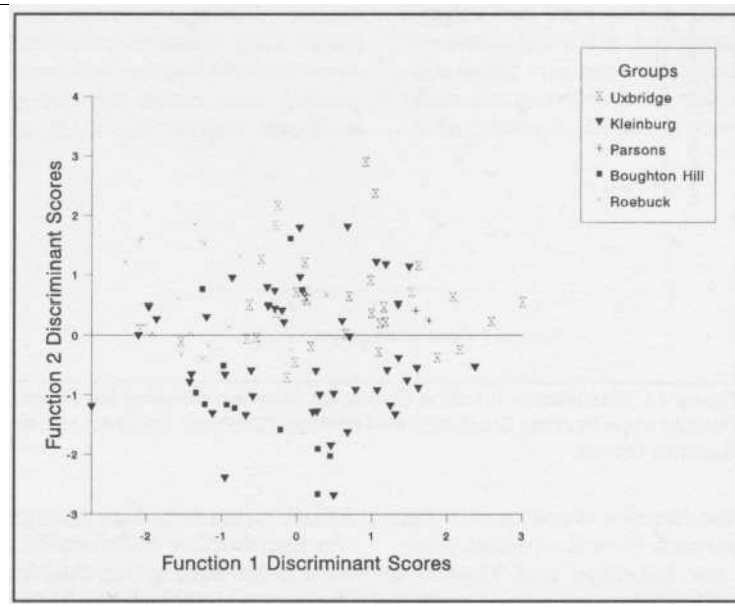

Figure 41. Discriminant Function Scores for the Total Group, Demonstrating the Location of the Parsons Site Crania Relative to Uxbridge, Kleinburg, Boughton Hill, and Roebuck Individuals.

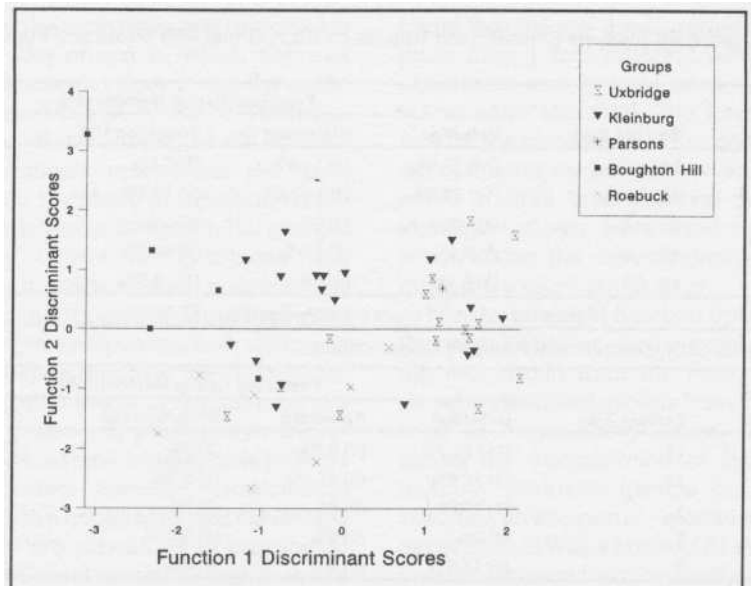

Figure 42. Discriminant Function Scores for Males, Displaying the Location of the Parsons Cranium in Relation to the Uxbridge, Kleinburg, Boughton Hill, and Roebuck Groups.

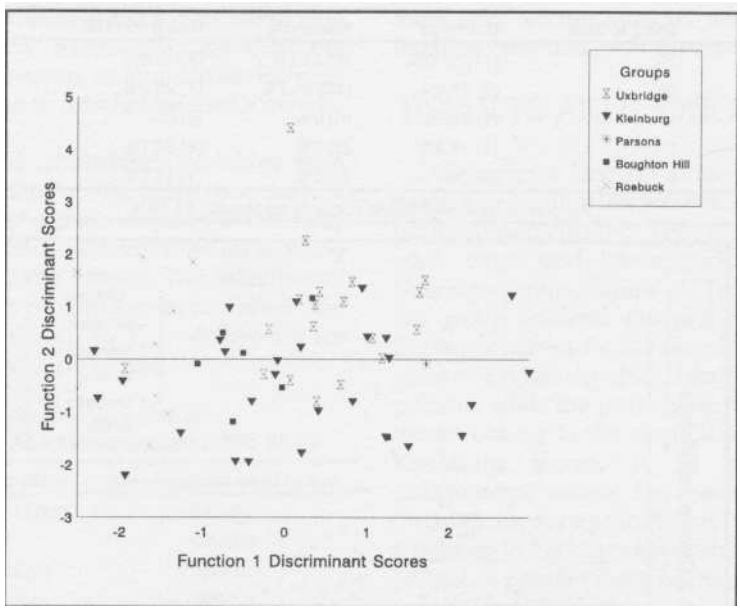

Figure 43. Discriminant Function Scores for Females, Showing the Relative Position of the Parsons Cranium to the Uxbridge, Kleinburg, Boughton Hill, and Roebuck Groups.

Analysis of the females alone once again reveals that the female Parsons cranium closely resembles the Uxbridge and Kleinburg groups (Figure 43). The cranium is classified as belonging to Uxbridge (53 percent probability), and as having a 43 percent probability of belonging to the Kleinburg group (Table 80). An examination of Tables 79 and 80 reveals that within each group the females are much more variable than the males. This is especially evident for the females of the Kleinburg group. The females of the Kleinburg group are

Table 81. Summary of Variables and their Associated Levels of Significance for the Total Group, Males and Females. For each group, variables are listed from most to least significant.

Total Sample		Males		Females	
VARIABLES	P-VALUE	VARIABLES	P-VALUE	VARIABLES	P-VALUE
BBHT	0.04	BBHT	0.01	BLCH	0.05
NBCH	0.05	MAXCB	0.11	BIAB	0.08
MINFB	0.06	GOLEN	0.17	BNLEN	0.10
BIAB	0.06	LOCH	0.23	MINFB	0.14
BLCH	0.12	NBCH	0.29	GOLEN	0.14
BISB	0.34	BISB	0.36	NBCH	0.15
LOCH	0.38	MINFB	0.44	LOCH	0.32
BNLEN	0.42	BIAB	0.52	BBHT	0.75
GOLEN	0.56	BLCH	0.53	BISB	0.81
MAXCB	0.74	BNLEN	0.62	MAXCB	0 95

the most variable with approximately 46 percent of the individuals classified as belonging to Boughton Hill or Roebuck, both sites located a considerable distance away.

Wilk's lambda (U-statistic) and corresponding level of significance reveal which variables are important in classifying individuals into different groups. Examination of Table 81 indicates that for the total sample, basion-bregma height and nasion-basion chord are the most significant variables for classification. For males, basion-bregma height and maximum cranial breadth are the most significant. The levels of significance for females demonstrate a virtual mirror image of the males. Basion-larnbda chord and biasterionic breadth are the most important variables when separating females into the appropriate groups. These two variables are among the least significant for males. Conversely, the most important variables for males (BBHT and MAXCB) are among the least significant for females.

This study has demonstrated that there is craniometric variability among late prehistoric Iroquoians; those that are closest geographically appear most similar. However females showed far greater variability than males in craniometric measurements.

Individual measurements appear to contribute meaningful information about differences between the sexes, but further investigation is needed. The discriminant analysis demonstrates that the Parsons crania more closely resemble groups in the vicinity than groups to the south and east. This does not preclude their being captives of war or slaves taken from groups in the immediate area.

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