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Morphological Variation Among the Historic Period Maya at Tipu, Belize

Research Year: 2002

Culture: Maya

Chronology: Colonial

Location: Belize

Site: Tipu

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Summary

Comparisons of long bone robusticity measurements within the Colonial cemetery population of Tipu, Belize, revealed significant morphometric differences between males placed inside and outside the walls of the church. These discrepancies likely relate to Catholic burial practices in which placement inside of the church is reserved for higher status individuals. Though females do not appear to differ between burial areas, the variation for each of their measurements equals that of the males, suggesting the presence of similar social divisions that also resulted in the differentiation of activity patterns.

Resumen

Comparaciones de la robusticidad de huesos largos en la población del cementerio colonial de Tipu, en Belice, revelaron significantes diferencias morfométricas entre individuos del sexo masculino localizados adentro y afuera de la iglesia. Esas

discrepancias se relacionan probablemente a las prácticas Católicas de enterramiento, en donde la colocación adentro de la iglesia está reservada para individuos de mayor status social. Apesar de que mujeres aparentemente no difieren entre las dos áreas de enterramiento, la variación de cada una de sus medidas se iguala a la de los hombres, sugiriendo la presencia de divisiones sociales similares, que resultaron igualmente en la diferenciación de padrones de actividad.

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Introduction

The present study is part of the continuing analysis of a dataset composed of long bone measurements taken from the Colonial Maya cemetery population of Tipu, Belize. The results presented here compliment those from the recent discriminant function analysis by Wrobel, Danforth, and Armstrong (2002) using long bone robusticity measurements to document variation between sexes in the Tipu series. Because of the excellent preservation of these skeletons, the sex of many of the individuals could be estimated using reliable non-metric indicators from the pelvis and skull, which are preserved very rarely in prehistoric Maya remains. Statistical comparisons of long bone measurements from males and females sexed by pelvic indicators resulted in a set of equations that can be used to estimate the sex of fragmentary Maya skeletons. In an attempt to gain a better understanding of the Tipu population, the present study seeks to test for the presence of morphological variation between different groups of individuals using archaeological data related to status distinctions.

Materials and Methods

The Tipu Historic skeletal population consists of 588 individuals, of whom 253 are intact primary burials, 106 are partly disturbed primary burials, and the rest are extensively disturbed by later intrusive interments. The present study of the Tipu remains utilizes metric data from the long bones of 134 well-preserved adults (71 males and 63 females). Sex estimates for these individuals were derived from multiple non-metric indicators of the skull and pelvis instead of with the discriminant functions described above. Most adults in the Tipu population were young, with few surviving past the age of forty.

Published studies of the Tipu skeletons generally have not focused on finding intracemetery variation, but rather treated them as a single population (Cohen *et al.*, 1997, 1994). A notable exception is Jacobi's (2000) study of metric and non-metric dental traits, in which he describes several pieces of evidence that show burial location was not random and thus may have had social or temporal significance. However, he was unable to find genetic differences between groups of individuals buried in different locations in and around the church. Since the Tipu population was composed of a diverse group of Maya, many of whom had fled the Yucatán, the homogeneity of the population may instead reflect the regional indigenous population rather than identify differences between local populations. Furthermore, temporal variation is also expected to be of marginal importance in defining diversity within the cemetery since archaeological and ethnohistorical evidence suggest that the vast majority of the burials from the Tipu cemetery were likely to have been interred during the church's use, which spans a period of only about 70 years (A.D. 1568 to 1638).

Since the Tipu cemetery population appears to be quite genetically and temporally homogenous, the present study instead tests for intracemetery morphological variation using archaeological indicators believed to correspond to status-related differences within the community. Status distinctions within the cemetery were tested using two methods. First, individuals with grave goods were compared to unfurnished burials, assuming that only the high status individuals would have been distinguished by grave wealth ([Table 1](#) and [Table 2](#)). In this sample, only 24 individuals had grave goods, 17 of them male, and 7 female. Second, burial location in relation to the church was also used as a proxy for status. Miller and Farriss (1979) note that in the Catholic Church in Europe and the New World, placement inside the church was reserved for higher status individuals, especially males, with the most important placed near the altar. Jacobi (2000) identified sex and age biases in different areas in the Tipu cemetery that he attributes to these Catholic burial practices, and possibly as well by traditional patrimonial Maya social organization. For instance, significantly more males than females were placed inside the church and near the altar, and significantly more females are placed outside than inside. Also, while earlier burials were disturbed in some locales, those found around the nave were not, perhaps testifying to their high status.

Excavations of the Tipu church by Graham (1989) revealed a long polygonal structure with parallel sides and an altar at one end. Two general groups were formed by placement either inside or outside of the church ([Table 3](#) and [Table 4](#)). Another set of comparisons used subsets based on smaller areas ([Table 5](#) and [Table 6](#)). The individuals buried inside the church were divided into two groups: front (i.e., near the altar) and back. The individuals buried outside the cemetery were divided into three groups placed north, south and west of the church. These divisions follow Jacobi's (2002) study.

Data for these comparisons were composed of 25 measurements taken by Carl Armstrong, Marie Danforth, and by me at SUNY Plattsburgh, where the skeletons are presently curated. Tables 1 through 6 list these measurements, the majority of which are described by Wrobel and colleagues (2002). In addition, the present analysis

includes measurements of long bone lengths and medial-lateral diameters that were not included in the article, but which are described by Bass (1995). Tables 1 through 6 list the number of cases, means, and standard deviations of the measurements for each comparison. Because of the fairly small sample sizes, nonparametric procedures (Mann-Whitney test) were employed to test differences between the group means.

Results

Comparisons of the measurements of individuals grouped by the presence or absence of grave goods showed no significant differences for either sex. This result is not unexpected given the scarcity of burials with grave goods. Furthermore, grave furnishings at Colonial Tipu were fairly functional and mundane, consisting mostly of copper needles, rings, pins, and clothing fasteners, and thus likely do not segregate adequately the population into social tiers (Graham and Bennett 1989).

The results of the comparisons of grave location, however, were much more informative and show different patterns for males and for females ([Table 7](#)). In general, females did not differ between areas. Comparisons of females placed inside and outside of the cemetery showed no significant differences for any of the long bone robusticity or length measurements. When divided further into specific areas in and around the church, most groups of females still do not seem to display many significant differences from one another. The exception is the group buried north of the church, whose distinction from all other groups is likely due to its small sample of only four females. In all of the comparisons of measurements that showed a significant difference between groups of females, at least one of the two groups being compared was represented by fewer than ten individuals, and usually by fewer than five. Therefore, sampling error likely can be blamed for most, if not all, of these differences.

Comparisons of males, in general, are not significant between the two groups inside of the church or between the three groups outside of the church. However, both of the male groups inside the church do show many significant differences when compared to those buried outside the church. Though many of the male groups in these comparisons also are comprised of fewer than ten individuals, the sample sizes are generally larger than those of the females. Furthermore, the fairly consistent patterns of morphological differences between these subdivided groups are supported by the comparisons of the two larger groupings of individuals. Males buried inside the church are significantly larger than those buried outside for 9 of the 22 robusticity measurements, including the following:

- ◆ Femoral subtrochanteric a-p diameter
- ◆ Femoral subtrochanteric m-l diameter
- ◆ Femoral midshaft m-l diameter
- ◆ Femoral midshaft circumference
- ◆ Femoral head diameter
- ◆ Tibia nutrient foramen m-l diameter

- ◆ Humeral midshaft minimum diameter
- ◆ Humeral midshaft circumference

Of the three length measurements, only the humerus showed any significant difference between males, with the outside group having the larger values. However, this difference may be the result of the smaller sample size for this measurement. Tibia and femur lengths did not show significant differences between the groups. Despite the lack of discrimination observed between female groups, comparisons of each measurement between females and males using ANOVA found no significant F-values, suggesting that the variability of male and female values is not significantly different within the cemetery population.

Discussion

Morphological differences between groups of males found within the Colonial Maya population at Tipu correspond to their placement either within or around the walls of the church. According to Catholic traditions, interment inside the church is reserved for higher status individuals, and among the Tipu males, this social distinction led to or was the result of greater robusticity of some long bone dimensions. The morphological distinctions found here are thought to be the result of short-term environmental factors including activity patterns. First, since femur and tibia lengths were not significantly different between the groups, social differences implied by burial placement do not seem to have contributed to stature variation, as it did in the Classic Maya (Haviland 1967, Saul 1972, Stewart 1953; though see Danforth 1994 for a critique). This homogeneity suggests that childhood health and nutrition was fairly homogenous within the population. Second, Jacobi's (2000) study of dental metric and nonmetric traits did not find evidence of genetic differences between these burial groups, further supporting an environmental basis for the discrepancies.

Females at Tipu do not seem to display significant morphological variation. The studies of stature in Classic Maya groups mentioned above also find that females tend to vary less than males between status and temporal groups. Haviland (1967) has proposed that the stability of female stature over time was the result of their consistently low status in Maya society. A more likely explanation is that females have a greater degree of genetic buffering so that they are more resistant to stunting as a result of childhood stress (Stinson 1985). Since no differences in stature are apparent at Tipu for either sex, discrepancies in robusticity measurements of long bones more likely represent differences in activity patterns, rather than the long-term effects of nutritional stress. Males found inside the church were more robust and thus may be interpreted as more physically active despite (or as the key to) their higher status within the church and the community. The lack of discrimination between the female groups may be interpreted as a less diverse set of activity patterns. However, this should in no way undermine the role of females in Colonial Maya society. In fact, Jones (1989: 89) notes that though the activities of women during this time are rarely documented, they were deeply involved in economic production, distribution and consumption, despite the dominant role of males

in these activities. Therefore, status differences among women at Tipu likely existed. The lack of physical discrimination, however, suggests either that differences in activity patterns related to status among women did not affect their musculature, or that burial placement does not adequately correspond to female status. Statistical comparisons between males and females of the variation of each measurement seem to support the latter interpretation, since the relative variation among the female measurements is equal to that of males. The key difference is that the factors affecting female robusticity do not seem to be related to their placement in or around the church. If one assumes that long bone dimensions are affected by an individual's status within the community, as they appear to be in the case of males, then it appears that the rules governing burial treatment were different for males and for females.

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Table 1. Longbone robusticity measurements (mm) of Tipu males grouped by the presence or absence of grave goods.

	With Grave Goods			No Grave Goods		
	N	Mean	S.D.	N	Mean	S.D.
Femur						
Subtroch a-p diam	17	23.59	1.87	51	23.96	2.19
Subtroch m-l diam	17	31.06	1.78	51	30.76	2.31
Midshaft a-p diam	17	28.06	3.31	52	28.17	1.97
Midshaft m-l diam	17	26.59	1.87	52	26.48	1.69
Midshaft circum	17	83.59	4.08	52	84.37	4.71
Head diam	15	45.47	1.73	40	45.08	1.65
Maximum a-p diam	13	28.62	1.12	27	28.81	2.00
Length	15	423.13	11.19	37	428.35	19.44
Tibia						
Nutri For a-p diam	17	32.94	1.71	49	33.06	1.77
Nutri For m-l diam	17	21.65	2.06	49	22.02	2.27
Midshaft a-p diam	17	29.53	1.33	50	29.78	1.63
Midshaft m-l diam	17	20.29	1.69	50	20.26	1.45
Midshaft circum	17	78.24	3.29	50	79.00	4.15
Min circum	13	72.00	2.80	27	72.30	4.20
Length	11	360.27	16.39	35	367.00	15.78
Humerus						
Midshaft max diam	17	21.65	1.27	50	21.46	2.00
Midshaft min diam	17	16.59	1.28	50	16.48	1.72
Midshaft circum	17	62.29	2.64	50	62.08	4.39
Head diam	6	43.00	0.89	27	43.07	2.00
Length	14	277.07	45.04	31	279.71	45.02
Deltoid diam	10	23.10	1.20	24	22.38	1.74
Minimum circum	10	60.50	2.42	24	60.54	3.43

Ulna						
Minimum circum	13	35.31	3.75	24	34.58	1.93
Radius						
Minimum circum	12	41.50	1.98	27	41.44	2.19
Tuberosity diam	13	15.62	0.87	28	16.29	1.30

Table 2. Longbone robusticity measurements of Tipu females grouped by the presence or absence of grave goods.

	With Grave Goods			No Grave Goods		
	N	Mean	S.D.	N	Mean	S.D.
Femur						
Subtroch a-p diam	7	21.71	1.50	54	21.26	1.33
Subtroch m-l diam	7	27.14	1.57	54	28.20	1.68
Midshaft a-p diam	7	24.14	1.86	55	23.87	1.81
Midshaft m-l diam	7	24.86	1.35	55	24.85	1.67
Midshaft circum	7	74.71	4.99	55	75.55	4.29
Head diam	6	39.50	2.59	43	38.65	1.80
Maximum a-p diam	6	25.00	2.10	34	25.59	1.67
Length	6	388.00	13.25	39	391.03	12.76
Tibia						
Nutri For a-p diam	7	28.14	1.86	54	28.15	1.83
Nutri For m-l diam	7	19.86	1.57	54	18.93	1.60
Midshaft a-p diam	7	25.71	1.50	56	25.32	2.05
Midshaft m-l diam	7	17.86	1.35	56	17.54	1.41
Midshaft circum	7	68.43	3.95	56	67.68	3.83
Min circum	6	61.83	2.93	33	62.67	3.31
Length	6	323.00	13.34	33	324.61	16.85
Humerus						
Midshaft max diam	7	19.14	1.07	49	18.65	1.56
Midshaft min diam	7	14.29	0.95	49	13.71	1.14

Midshaft circum	7	56.14	3.24	49	53.33	3.85
Head diam	5	39.00	3.46	19	36.63	1.57
Length	5	247.00	45.36	28	245.46	45.71
Deltoid diam	6	20.17	1.17	25	19.28	1.81
Minimum circum	6	53.67	3.39	25	51.52	3.02
Ulna						
Minimum circum	5	30.00	2.65	27	29.78	2.15
Radius						
Minimum circum	6	36.33	3.44	31	35.58	2.14
Tuberosity diam	6	14.17	1.94	31	13.90	1.14

Table 3. Longbone robusticity measurements of Tipu males grouped by placement inside or outside of church.

	Inside Church			Outside Church		
	N	Mean	S.D.	N	Mean	S.D.
Femur						
Subtroch a-p diam	36	24.67	2.07	31	22.97	1.82
Subtroch m-l diam	36	31.33	1.84	31	30.26	2.46
Midshaft a-p diam	37	28.35	1.95	31	27.81	2.73
Midshaft m-l diam	37	26.95	1.49	31	26.00	1.88
Midshaft circum	37	85.32	4.64	31	82.71	4.11
Head diam	28	45.46	1.35	26	44.69	1.67
Maximum a-p diam	18	28.17	1.38	22	29.23	1.90
Length	24	426.33	17.85	28	427.29	17.53
Tibia						
Nutri For a-p diam	33	33.39	1.92	32	32.66	1.52
Nutri For m-l diam	33	22.45	2.59	32	21.38	1.64
Midshaft a-p diam	34	29.79	1.63	32	29.59	1.50
Midshaft m-l diam	34	20.53	1.62	32	19.94	1.32
Midshaft circum	34	78.91	4.20	32	78.66	3.77

Min circum	17	71.35	3.62	23	72.83	3.82
Length	17	362.47	12.33	29	367.10	17.8
Humerus						
Midshaft max diam	33	21.88	2.20	33	21.12	1.34
Midshaft min diam	33	17.03	1.85	33	15.94	1.12
Midshaft circum	33	63.30	4.38	33	60.91	3.29
Head diam	13	43.92	1.75	20	42.50	1.70
Length	16	249.69	44.92	29	295.00	35.76
Deltoid diam	12	22.67	1.72	22	22.55	1.60
Minimum circum	12	61.42	3.70	22	60.05	2.73
Ulna						
Minimum circum	14	34.71	3.41	23	34.91	2.21
Radius						
Minimum circum	17	41.76	2.28	22	41.23	1.97
Tuberosity diam	18	16.28	1.49	23	15.91	0.95

Table 4. Longbone robusticity measurements of Tipu females grouped by placement inside or outside of church.

	Inside Church			Outside Church		
	N	Mean	S.D.	N	Mean	S.D.
Femur						
Subtroch a-p diam	23	21.26	0.96	37	21.27	1.5
Subtroch m-l diam	23	28.26	1.84	37	27.89	1.54
Midshaft a-p diam	24	23.75	1.39	37	23.95	2.03
Midshaft m-l diam	24	25.00	1.91	37	24.76	1.46
Midshaft circum	24	75.33	3.95	37	75.43	4.65
Head diam	21	39.00	2.26	28	38.57	1.60
Maximum a-p diam	12	25.33	1.67	28	25.57	1.77
Length	16	391.19	11.98	29	390.31	13.3
Tibia						

Nutri For a-p diam	24	28.67	1.88	37	27.81	1.71
Nutri For m-l diam	24	19.29	1.37	37	18.86	1.75
Midshaft a-p diam	25	25.36	2.50	37	25.35	1.62
Midshaft m-l diam	25	17.72	1.21	37	17.35	1.34
Midshaft circum	25	68.20	4.14	37	67.22	3.30
Min circum	11	62.09	2.39	28	62.71	3.54
Length	11	323.55	14.50	28	324.68	17.08
Humerus						
Midshaft max diam	20	18.70	1.22	35	18.63	1.59
Midshaft min diam	20	13.70	1.30	35	13.80	1.02
Midshaft circum	20	53.65	2.89	35	53.46	4.18
Head diam	7	37.43	3.51	17	37.00	1.58
Length	6	212.00	39.49	27	253.19	43.20
Deltoid diam	6	18.83	1.17	25	19.60	1.83
Minimum circum	6	51.00	1.55	25	52.16	3.41
Ulna						
Minimum circum	9	29.22	1.09	23	30.04	2.48
Radius						
Minimum circum	10	35.60	1.78	27	35.74	2.57
Tuberosity diam	10	13.50	1.08	27	14.11	1.31

Table 5. Longbone robusticity measurements of Tipu males grouped by specific relationship to church.

	Inside Front of Church			Inside Back of Church		
	N	Mean	S.D.	N	Mean	S.D.
Femur						
Subtroch a-p diam	19	25.16	2.46	17	24.12	1.41
Subtroch m-l diam	19	31.42	1.80	17	31.24	1.92
Midshaft a-p diam	19	28.58	1.61	18	28.11	2.27
Midshaft m-l diam	19	26.89	1.24	18	27.00	1.75

Midshaft circum	19	86.21	4.52	18	84.39	4.70
Head diam	17	45.65	1.27	11	45.18	1.47
Maximum a-p diam	9	28.67	1.41	9	27.67	1.22
Length	13	428.92	19.15	11	423.27	16.55
Tibia						
Nutri For a-p diam	19	33.26	2.16	14	33.57	1.60
Nutri For m-l diam	19	23.11	2.77	14	21.57	2.10
Midshaft a-p diam	19	29.79	1.44	15	29.80	1.90
Midshaft m-l diam	19	20.74	1.56	15	20.27	1.71
Midshaft circum	19	79.05	4.12	15	78.73	4.43
Min circum	9	71.56	2.92	8	71.13	4.49
Length	10	364.4	14.14	7	359.71	9.52
Humerus						
Midshaft max diam	17	22.06	2.75	16	21.69	1.49
Midshaft min diam	17	16.65	2.18	16	17.44	1.36
Midshaft circum	17	63.18	5.21	16	63.44	3.44
Head diam	6	44.33	1.75	7	43.57	1.81
Length	9	243.00	41.60	7	258.29	50.83
Deltoid diam	6	22.83	1.47	6	22.50	2.07
Minimum circum	6	60.33	1.51	6	62.50	5.01
Ulna						
Minimum circum	7	35.14	2.34	7	34.29	4.39
Radius						
Minimum circum	9	42.00	2.35	8	41.50	2.33
Tuberosity diam	9	16.11	1.05	9	16.44	1.88

Table 5 continued. Longbone robusticity measurements of Tipu males grouped by specific relationship to church.

	North of Church			West of Church			South of Church		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.

Femur									
Subtroch a-p diam	6	23.33	2.34	11	23.09	1.64	14	22.71	6
Subtroch m-l diam	6	29.83	2.32	11	30.73	3.00	14	30.07	6
Midshaft a-p diam	6	27.33	1.21	11	29.00	3.85	14	27.07	6
Midshaft m-l diam	6	26.33	1.63	11	26.36	1.43	14	25.57	6
Midshaft circum	6	83.83	2.48	11	83.82	3.63	14	81.36	6
Head diam	6	44.83	1.47	9	44.22	1.72	11	45.00	6
Maximum a-p diam	5	29.60	1.82	7	29.29	1.25	10	29.00	5
Length	5	438.20	21.65	9	427.67	14.69	14	423.14	5
Tibia									
Nutri For a-p diam	6	32.67	1.75	12	33.08	1.24	14	32.29	6
Nutri For m-l diam	6	21.00	1.10	12	21.42	1.38	14	21.50	6
Midshaft a-p diam	6	30.50	1.64	12	29.75	1.42	14	29.07	6
Midshaft m-l diam	6	19.50	1.05	12	20.25	1.54	14	19.86	6
Midshaft circum	6	78.67	3.08	12	79.17	3.56	14	78.21	6
Min circum	5	72.80	5.17	8	72.75	2.38	10	72.90	5
Length	6	378.83	20.33	9	363.56	11.45	14	364.36	6
Humerus									
Midshaft max diam	6	20.83	1.47	13	21.00	1.47	14	21.36	6
Midshaft min diam	6	15.67	1.03	13	16.31	0.85	14	15.71	6
Midshaft circum	6	60.17	3.06	13	61.00	2.71	14	61.14	6
Head diam	5	43.60	1.52	7	41.57	0.98	8	42.63	5
Length	6	292.67	47.61	9	295.44	35.91	14	295.71	6
Deltoid diam	5	21.60	2.07	7	23.14	0.90	10	22.60	5
Minimum circum	5	58.80	3.19	7	61.29	1.38	10	59.80	5
Ulna									
Minimum circum	5	35.40	1.82	8	34.88	2.95	10	34.70	5
Radius									
Minimum circum	5	40.60	2.51	7	42.57	1.51	10	40.60	5
Tuberosity diam	5	15.80	1.30	8	16.00	1.07	10	15.90	5

Table 6. Longbone robusticity measurements of Tipu females grouped by specific relationship to church.

	Inside Front of Church			Inside Back of Church		
	N	Mean	S.D.	N	Mean	S.D.
Femur						
Subtroch a-p diam	16	21.38	0.89	7	21.00	1.15
Subtroch m-l diam	16	28.25	1.77	7	28.29	2.14
Midshaft a-p diam	17	23.65	1.06	7	24.00	2.08
Midshaft m-l diam	17	25.00	1.90	7	25.00	2.08
Midshaft circum	17	75.12	3.74	7	75.86	4.71
Head diam	16	38.69	2.18	5	40.00	2.45
Maximum a-p diam	9	24.78	1.20	3	27.00	2.00
Length	12	389.08	11.42	4	397.5	13.00
Tibia						
Nutri For a-p diam	16	28.19	1.80	8	29.63	1.77
Nutri For m-l diam	16	19.19	1.52	8	19.50	1.07
Midshaft a-p diam	17	25.12	2.60	8	25.87	2.36
Midshaft m-l diam	17	17.65	1.37	8	17.88	0.83
Midshaft circum	17	67.94	4.45	8	68.75	3.62
Min circum	8	61.13	2.03	3	64.67	0.58
Length	10	323.80	15.26	1	321.00	N/A
Humerus						
Midshaft max diam	15	18.60	1.24	5	19.00	1.22
Midshaft min diam	15	13.33	1.18	5	14.80	1.10
Midshaft circum	15	52.87	2.67	5	56.00	2.35
Head diam	6	37.50	3.83	1	37.00	N/A
Length	5	218.00	40.98	1	182.00	N/A
Deltoid diam	5	19.20	0.84	1	17.00	N/A
Minimum circum	5	51.20	1.64	1	50.00	N/A

Ulna						
Minimum circum	7	29.29	1.25	2	29.00	0.00
Radius						
Minimum circum	8	35.38	1.92	2	36.50	0.71
Tuberosity diam	8	13.50	1.20	2	13.50	0.71

Table 6 continued. Longbone robusticity measurements of Tipu females grouped by specific relationship to church.

	North of Church			West of Church			South of Church		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
Femur									
Subtroch a-p diam	4	20.50	0.58	21	21.29	1.49	12	21.50	1.73
Subtroch m-l diam	4	26.00	0.82	21	28.33	1.43	12	27.75	1.48
Midshaft a-p diam	4	21.75	0.96	21	23.95	2.06	12	24.67	1.78
Midshaft m-l diam	4	23.00	0.82	21	25.14	1.53	12	24.67	1.07
Midshaft circum	4	69.25	0.50	21	75.90	4.78	12	76.67	3.60
Head diam	2	38.00	1.41	16	38.19	1.52	10	39.30	1.64
Maximum a-p diam	3	24.00	1.00	15	25.40	1.92	10	26.30	1.42
Length	4	381.25	11.00	14	387.86	13.84	11	396.73	11.1
Tibia									
Nutri For a-p diam	4	25.75	0.50	21	28.00	1.45	12	28.17	1.99
Nutri For m-l diam	4	17.00	0.82	21	19.10	1.34	12	19.08	2.27
Midshaft a-p diam	4	24.25	0.96	21	25.62	1.53	12	25.25	1.86
Midshaft m-l diam	4	15.75	0.96	21	17.48	1.17	12	17.67	1.44
Midshaft circum	4	62.25	1.71	21	67.81	2.93	12	67.83	3.04
Min circum	3	58.00	1.73	15	63.13	3.44	10	63.50	3.17
Length	4	313.25	16.05	13	324.69	19.13	11	328.82	14.14
Humerus									
Midshaft max diam	4	17.00	0.82	21	18.57	1.50	10	19.40	1.58
Midshaft min diam	4	13.50	0.58	21	13.62	0.97	10	14.30	1.16

Midshaft circum	4	50.75	2.50	21	53.10	3.75	10	55.30	5.03
Head diam	0	N/A	N/A	8	36.50	1.60	9	37.44	1.51
Length	4	274.00	8.60	13	232.00	48.56	10	272.40	31.17
Deltoid diam	3	18.00	1.00	14	19.57	1.55	8	20.25	2.25
Minimum circum	3	48.67	1.15	14	52.14	2.66	8	53.50	4.38
Ulna									
Minimum circum	3	28.00	1.00	11	30.45	1.86	9	30.22	3.23
Radius									
Minimum circum	3	34.33	1.53	14	35.79	2.15	10	36.10	3.31
Tuberosity diam	3	13.00	1.00	14	14.21	1.12	10	14.30	1.57

Table 7. Comparison of burial groups based on burial location.			
Groups Compared		# of Significantly Different Measurements ¹	
		Males	Females
Inside Church	Outside Church	10	0
Inside Front	Inside Back	1	3
Inside Front	North	2	12
Inside Front	West	5	0
Inside Front	South	6	1
Inside Back	North	2	8
Inside Back	West	4	1
Inside Back	South	6	0
North	West	1	12
North	South	0	12
West	South	1	0
Note 1. (p < .05)			

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