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A COMPARATIVE ANALYSIS OF PREHISTORIC SKELETAL  
REMAINS FROM THE LOWER SACRAMENTO VALLEY

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## Introduction

This report will examine in some detail three skeletal series of adult males from the northern part of the Central Valley of California. Comparisons will be made between the three series and certain other published cranial series for the purpose of elucidating, in as far as the material permits, the nature of the physical characteristics of the prehistoric populations of this area and examining their relationships with those of other areas. The shortcomings and limitations of the material will become obvious to the reader as various aspects of the problem are treated, and I have attempted to restrict interpretation and speculation to what can reasonably be inferred in view of these limitations.

The Central Valley series reported here were selected from, and form part of, the skeletal collection of the University of California Museum of Anthropology. The grouping is on the basis of chronological periods shown by archaeological evidence. The series from the Early Central Californian Horizon, Interior Valley Zone will for brevity be hereafter referred to as the Early Series. The series from the Middle Central Californian Horizon and Late Central Californian Horizon, both of the Interior Valley Zone, will be called the Middle Series and Late Series respectively (Cook and Heizer, 1947, p. 216).

Each series was selected separately from archaeologically assignable material on the basis of two criteria. First, the specimen had to be an adult male, over twenty years of age based on epiphyseal union in the long bones, dental eruption, and ectocranial suture closure. Second, the specimen had to be fairly complete so that a number of measurements and observations could be obtained. These requirements exerted a certain selectivity on the resulting series of undetermined extent. Since female specimens were excluded, there is no doubt that border-line cases where sex was doubtful were also excluded. This tended to accentuate the masculinity of the series as against the type of investigation where all burials from one site are sexed and all probable and possible males are combined into a male series. The selection of well-preserved specimens may also have biased the series towards masculinity by a selective process of preservation, but this is purely speculation. There is no evidence at the present time that the remains of males have been appreciably better preserved than those of females. An attempt was made to keep the three series roughly comparable in size. This was not possible in all measurements and observations due to marked differences in preservation in the different periods and sites.

The detailed analysis of the composition of the series by site and horizon is presented in Table 1. Certain general comments can be made on this table. Site Sac. 107 did not contribute appreciably to the Early Series because of extremely poor preservation. Sites Sac.66 and Sac.99 were deficient in post cranial material since it was not saved by the excavators. With the exception of these two sites the Middle Series is quite evenly distributed. In the Late Series site CCo. 138 shows a disproportionately high percentage

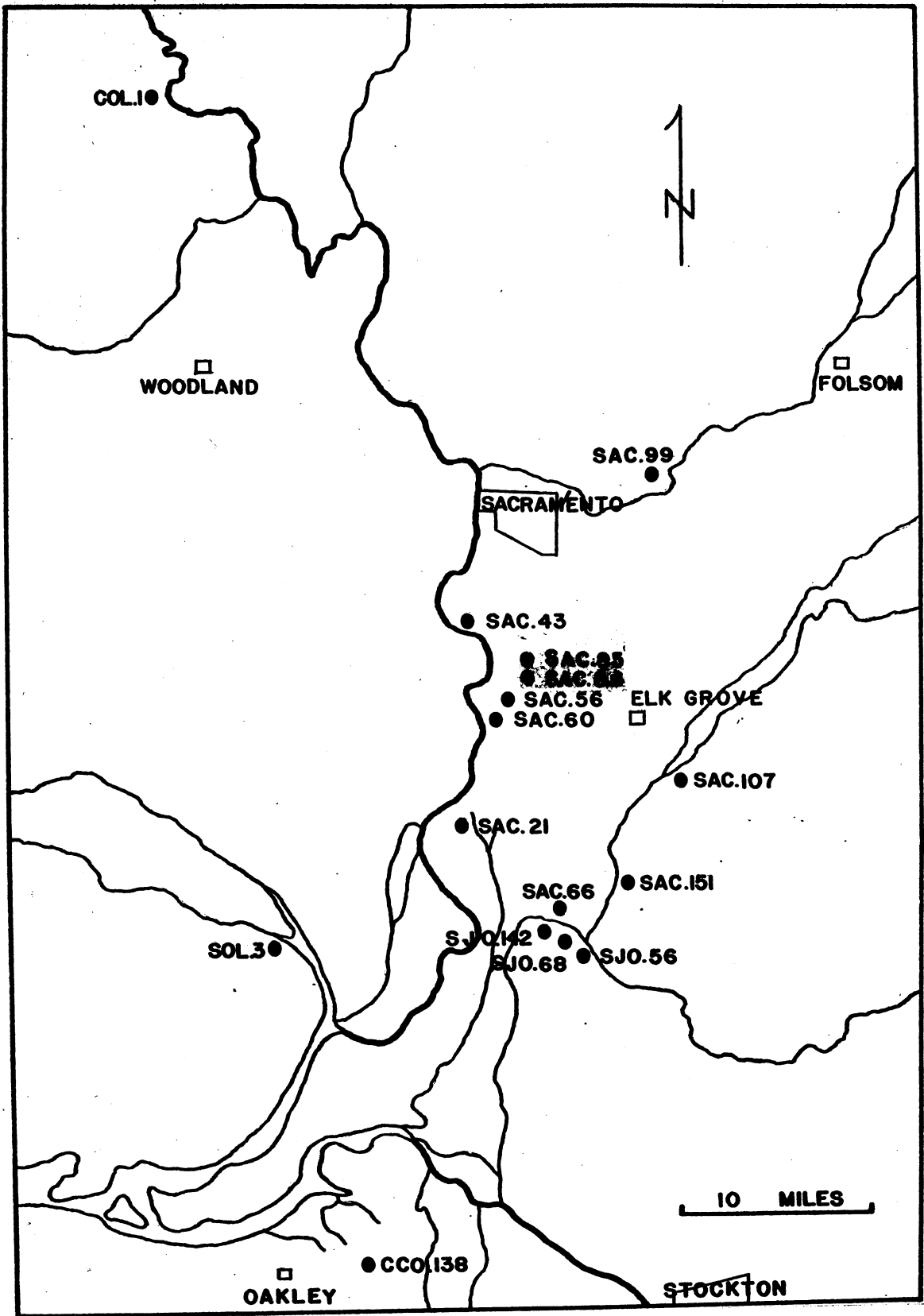
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In this paper, site designations having county symbols punctuated with dots are equivalent to UCAS designations, which employ dashes, e.g., Sac. 107 is the same as UCAS site Sac-107. Ed.

	CRANIAL		POST-CRANIAL	
	No.	Percent	No.	Percent
<b>Early Horizon Sites:</b>				
SJo. 56 (C.56)	11	23.91	10	21.74
SJo. 68 (C.68)	19	41.30	20	43.48
SJo. 142 (C.142)	15	32.61	13	28.26
Sac. 107 (C.107)	1	2.17	3	6.52
	<u>46</u>		<u>46</u>	
<b>Middle Horizon Sites:</b>				
Sac. 43 (S.43)	11	20.75	11	28.95
Sac. 60 (S.60)	10	18.87	10	26.32
Sac. 66 (C.66)	11	20.75	3	7.89
Sac. 99 (S.99)	9	16.98	2	5.26
Sac. 151 (C.151)	12	22.64	12	31.58
	<u>53</u>		<u>38</u>	
<b>Late Horizon Sites:</b>				
Col. 1 (S.1)	8	19.51	8	20.51
CCo. 138 (C.138)	16	39.02	15	38.46
Sol. 3 (Pete.3)	2	4.88	2	5.13
Sac. 21 (S.66)	5	12.20	5	12.82
Sac. 56 (S.56)	6	14.63	6	15.38
Sac. 60 (S.60)	1	2.44	0	0
Sac. 85 (S.85)	1	2.44	1	2.56
Sac. 86 (S.86)	2	4.88	2	4.88
	<u>41</u>		<u>39</u>	

( ) = previous designation of site numbers

Table 1. Composition of Horizon Series by Sites



MAP. 1. LOCATION OF SITES UTILIZED IN HORIZON SERIES.

		Interior Valley Zone			
		Delta Province		Colusa Province	
Late Central California	Phase II	Mosher facies Settlements: Sac. 56    Sac. 86 Sac. 60    Sol. 1 Sac. 85    CCo. 138		Miller facies Settlements: Col. 1	
		Horizon	Hollister facies Settlements: Sac. 21 Sac. 60 CCo. 138		Sandhill facies Settlements: Col. 1
Middle Central California	Interior Province				
	Horizon	Morse facies Settlements: Sac. 60 Sac. 66	Deterding facies Settlements: Sac. 99	Brazil facies Settlements: Sac. 43	Need facies Settlements: Sac. 151
Early Central California	Unnamed Province				
	Horizon	Windmillier facies Settlements: SJo. 56 SJo. 68 SJo. 142 Sac. 107			

Table 2. Cultural and Temporal Classification of Sites Utilized in the Horizon Series.



of the total cases studied, but the absence of other material made its use imperative. The sizes of the samples from the individual sites are too small to make intra-horizon and inter-site comparisons feasible. On the other hand, the combined series for each horizon are of respectable size when compared with other published series.

### Archaeological Background

The chronological stratification which was the basis for the selection and comparison of the skeletal remains treated here was first proposed in 1939 (Lillard, Heizer and Fenenga, 1939). The majority of specimens in the series were excavated in the 1930's when this sequence was being discovered. Map 1. illustrates the sites from which skeletal material was obtained and also the general archaeological area of the Interior Valley Zone. This covers an area approximately sixty miles from north to south by thirty miles from east to west.

Table 2 shows the sites from which the human material was utilized in this study in a cultural and temporal classification recently proposed for the area (Heizer, 1949, p. 3). All facies in the Zone are represented in the skeletal series with the exception of Orwood facies in the Middle Horizon, which is not shown. No attempt was made to segregate the Late Horizon into Phase I and Phase II specimens and all have been pooled as the Late Series.

The archaeological evidence behind this classification cannot be treated here, but some mention of the time interval involved is germane to a discussion of the physical types found in the area. The most recent estimate of the beginning dates of the various horizons by Heizer (op. cit., p. 39) is given below:

#### Time Chart of Central California Culture Horizons

1700 A.D. . . .	Late Horizon, Phase II
500 A.D. . . .	Late Horizon, Phase I
1500 B.C. . . .	Middle Horizon
2500 B.C. . . .	Early Horizon (Windmiller facies)

A shorter time-scale proposed by Martin, Quimby, and Collier (1947, Chart XV) is as follows: Early Horizon, 1 A.D.; Middle Horizon, 750 A.D.; and Late Horizon, 1000 A.D. Both of these are only estimates at the present time although there was some evidence bearing on the length of these periods from the chemical analysis of human bone from the three horizons (Cook and Heizer, op. cit., pp. 212-214). In any event, present archaeological dating for the Early Horizon would place its beginnings at not less than two thousand years and possibly over four thousand years ago. This is an exceedingly long time span to be encompassed by less than one hundred and fifty specimens, and it presents difficulties in interpretation that will be discussed later. Because of the long time span involved, no statistics have been calculated for the area as a whole. It is doubtful whether

such statistics would have any validity when compared with other published data, as, for example, the Pecos site with an estimated four hundred and fifty year span (Hooton, 1930, p. 343), or the Indian Knoll site with an estimated five hundred year span (Snow, 1948, p. 387).

An extensive resumé of the cultural similarities and differences between the three horizons is not necessary here. Such a summary has been published recently (Beardsley, 1948, pp. 5, 20). Archaeological evidence indicates somewhat different orientations and interests between horizons, while at the same time numerous traits are carried over with little change. There is no cultural evidence of complete replacement by foreign populations, but Beardsley believes that there is evidence of cultural changes of sufficient magnitude to make some intrusion of new populations a possibility, if not a probability.

#### Metrical and Morphological Comparisons Between the Series

This section will consist of items extracted from the metrical and morphological tabulations which will be found in Appendix A, and the reader should refer to these tables for statistical details. No attempt has been made to discuss all measurements and observations, since there is a lack of common agreement as to the significance and validity of some of them at the present time. Most of the summaries presented here will treat more with the differences than with the similarities, but a perusal of the complete tabulations will show that these constitute a minority only.

A few words of explanation about the metrical tabulations may be necessary. The statistical measures are largely self-explanatory and conventional. The S.D. column indicates the Standard Deviation or square root of the variance of the distribution. The formula employed,

$$\sigma = \sqrt{\frac{\sum (fd^2)}{N}}$$

is the most commonly accepted form (Simpson and Roe, 1939, p. 114). The V. column indicates the Coefficient of Variability,

$$V. = \frac{100\sigma}{M}$$

which is a rough method of comparing the S.D.'s of different measurements (Ibid., p. 122). The  $d/\sigma_d$  column is a test for significant difference between the means of two series. The formula

$$\sigma_d = \sqrt{\frac{N_1}{N_2} M_1^2 + \frac{N_2}{N_1} M_2^2}$$

differs somewhat from the usual "x p.e." in being more sensitive to differences in the number of specimens in the two series but gives approxi-

mately similar results (*Ibid.*, p. 193). The theoretical values may range from zero to infinity with 3.00 usually taken as the critical level of significance. This is obviously an arbitrary procedure and is only justified here by precedent. The initials preceding each measure in Tables 4 and 5 indicate the series between which the statistic was calculated.

#### Cranial Measurements and Observations

Before enumerating the individual measurements and indices in which the series show significant differences, a summary of the numerical occurrence of these measurements and indices will be useful. Out of fifty-five measurements and indices, the numbers of differences of a magnitude of 3.00 or larger are as follows:

	<u>No.</u>	<u>Percent</u>
Early - Middle	11	20.00
Middle - Late	10	18.18
Early - Late	16	29.09

It is difficult to find similar material with which to compare these figures. A chronologically divided series from the Central Coast of Peru has the following percentages of significant differences for thirty-one measurements and indices (Newman, M. T., 1947, p. 25):

<u>Period</u>	<u>Percent</u>
Early - Middle	30
Middle - Late	38
Early - Late	23

These are not only generally higher percentages but show a curious reversal of trend in the Early - Late comparisons. These differences were calculated by a slightly different formula which may account for the higher occurrence of statistically significant differences.

Due to the arbitrary nature of the dividing line between significant and nonsignificant levels, a more accurate picture may be obtained from a finer subdivision:

$d/\sigma_d$	<u>Early-Middle</u>		<u>Middle-Late</u>		<u>Early-Late</u>	
	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>	<u>No.</u>	<u>Percent</u>
0 - 1	19	34.55	21	38.18	18	32.73
1 - 2	16	29.09	15	27.27	17	30.91
2 - 3	9	16.36	9	16.36	4	7.27
3 - x	<u>11</u>	20.00	<u>10</u>	18.18	<u>16</u>	29.09
	55		55		55	

The distribution in the Early-Middle and Middle-Late columns shows a steady decrease in the percentage of significant differences as the level of significance rises, with apparent reversals probably due to chance. The relatively low number of differences in the 2 - 3 category in the Early-Late column is inexplicable, but probably not too important.

The individual measurements and indices that show statistically significant differences between horizons are listed below. It must be emphasized that some of these differences may be due to sampling errors, but there is no statistical means of determining which are actually valid and which are spurious.

<u>Early - Middle</u>		
<u>Measurement or Index</u>	<u>Difference Middle from Early</u>	<u>d/sd</u>
Glabello-Occipital Length	-4.89	3.81
Basion-Bregma Height	-4.34	3.48
Basion-Nasion Length	-3.13	3.54
Transverse Arc	-8.31	3.66
Height of Symphysis	-2.12	4.52
Bigonial Width	-4.75	3.60
Nasion-Prosthion Angle	-2.30	4.20
Nasion-Nasospinale Angle	+3.25	4.37
Cranial Module	-4.01	4.04
Nasalia-Transverse Index	+8.70	3.13
Fronto-Gonial Index	-4.66	3.45

The differences may be summarized briefly. Seven measurements show a decrease in cranial and facial size in the Middle Series, although they refer to different dimensions, some to length, some to height, and some to breadth. There is a slight increase in alveolar prognathism in the Middle Horizon. The Nasion-Nasospinale Angle is exceedingly difficult to measure consistently, and the Nasalia-Transverse Index shows such great variability in Standard Deviation that its worth is doubtful. The difference in Fronto-Gonial Index lies in different combinations of Minimum Frontal Diameter and Bigonial Width, since the means of the former are almost identical between the series.

The morphological observations are more difficult to deal with than are the measurements. Differences in percentages in the various categories have not been tested statistically, but fourteen of the more obvious differences are listed below.

Tendencies in Morphological Cranial Differences  
From Early to Middle

1. Decrease in muscularity.
2. Increase in ovoid skull form and decrease in sphenoid form.
3. Slight decrease in brow-ridge size.
4. Increase in frontal slope from perpendicular.
5. Greater post-orbital constriction.
6. Less sagittal elevation.
7. Smaller supramastoid crests.
8. Smaller nasion depression.
9. Smaller post-glenoid processes.
10. Lower palate height.
11. Smaller post-nasal spine.
12. More median chin form.
13. Greater ante-mortem loss of teeth.
14. Greater tendency toward overbite.

On the whole, these tendencies corroborate the metrical differences in showing a decrease in size and muscularity from Early to Middle.

Middle - Late

<u>Measurement or Index</u>	<u>Difference Late from Middle</u>	<u>d/sd</u>
Glabello-Occipital Length	-3.96	3.16
Maximum Width	+4.09	3.98
Nasalia, Upper Breadth	-1.76	3.01
Nasalia, Lower Breadth	-1.68	3.60
Foramen Magnum Length	-1.24	4.02
Transverse Arc	+8.16	4.29
Nasion-Nasospinale Angle	-3.01	4.69
Cranial Index	+4.48	7.03
Height-Length Index	+2.82	4.60
Auricular Height-Length Index	+3.51	5.90

Upon analysis, this is a much less impressive list than is the Early-Middle list. The Nasalia Breadth measurements are probably correlated with a decrease in Nasal Breadth which is close to the level of significance. The Nasion-Nasospinale Angle, as stated before, is of doubtful validity. Glabello-Occipital Length shows a decrease in Late, but all other measurements and indices are probably correlated with an increase in breadth measurements.

Tendencies in Morphological Cranial Differences  
From Middle to Late

1. Increase in slight occipital deformation.
2. Greater predominance of sphenoid skull form.
3. Increase in median brow-ridges.
4. Slight decrease in brow-ridge size.
5. Smaller glabellar prominence.
6. Lower frontal height.
7. More pronounced frontal slope from perpendicular.
8. Smaller frontal bosses.
9. Lower sagittal elevation.
10. Larger parietal bosses.
11. Larger temporal fullness.
12. Lower temporal crests.
13. Smaller occipital torus.
14. More frequent "Inca" bone.
15. Slightly smaller malars.
16. Thinner zygomatic processes.
17. Shallower glenoid fossae.
18. Thicker tympanic plates.
19. More concave nasal profile.
20. Less gonial eversion.
21. Increase in edge-to-edge bite.
22. Increase in tooth crowding.

The morphological differences are more striking between Middle and Late than are the metrical differences. In general, most of the differences seem to correlate with the increase in transverse diameters. What seem to be reversals of this are probably attributable to a slight decrease in muscularity.

Early - Late

<u>Measurement or Index</u>	<u>Difference Late from Early</u>	<u>d/a<sub>d</sub></u>
Glabella-Occipital Length	-8.85	6.73
Basion-Nasion Length	-3.23	3.77
Nasalia, Lower Breadth	-2.05	3.62
Foramen Magnum Length	-1.88	3.22
Nasion-Opisthion Arc	-9.73	3.23
Maximum Circumference	-10.59	3.26
Height of Symphysis	-2.50	3.54
Bigonial Width	-5.43	3.76
Nasion-Prosthion Angle	-3.48	5.29
Cranial Index	+4.90	6.70
Height-Length Index	+2.02	3.00
Height-Breadth Index	-3.06	3.84
Auricular Height-Length Index	+4.13	5.88

Early - Late (cont'd.)

<u>Measurement or Index</u>	<u>Difference Late from Early</u>	<u>d/σd</u>
Cranial Module	-2.92	3.02
Zygo-Gonial Index	-4.09	4.16
Fronto-Gonial Index	-7.46	4.25

These show a consistent decrease in most dimensions, with the positive differences in indices also attributable to the decreased Glabello-Occipital Length with correspondingly less decrease in the breadth dimensions.

Tendencies in Morphological Cranial Differences  
From Early to Late

1. Decrease in muscularity.
2. Increase in slight occipital deformation.
3. Greater predominance of sphenoid skull form.
4. Increase in median brow-ridges.
5. Decrease in brow-ridge size.
6. Smaller glabellar prominence.
7. Lower frontal height.
8. More pronounced frontal slope from perpendicular.
9. Smaller frontal bosses.
10. Larger parietal bosses.
11. Slightly greater temporal fullness.
12. Lower temporal crests.
13. Smaller occipital torus.
14. More frequent "Inca" bone.
15. Smaller malars.
16. Thinner zygomatic processes.
17. Shallower nasion depression.
18. Smaller post-glenoid processes.
19. Thicker tympanic plates.
20. Slightly more alveolar prognathism.
21. Lower palatal height.
22. Smaller mandible.
23. Less gonial eversion.
24. Greater ante-mortem tooth loss.
25. Smaller mandibular torus.
26. Greater tooth crowding.

Most of these changes were also noted in the comparison of Middle with Late, and the predominance of changes indicating decreasing size and muscularity is striking. It would be a mistake to assume that the diminution emphasized in the tabulations above has led to a small and gracile population in the Late Horizon. Actually, the Late people were characterized by large cranial dimensions when compared to series from other areas.

In terms of means of measurements some of these may exceed both the Early and Middle Horizon means.

The relative variability of the series may be measured in several ways. Since identical measurements and indices were calculated for each series it would be possible to compare the average Standard Deviations directly. The obvious draw-back is that the size of the Standard Deviation is proportional to the magnitude of the measurement, as well as to variability, and large measurements are over-weighted. The average Standard Deviation for fifty-five cranial measurements and indices is as follows: Early 6.23, Middle 5.77, and Late 5.89. This is of doubtful value since the Early measurements consistently run larger. The average Coefficient of Variability, which attempts to equalize large and small measurements, gives a somewhat different picture. For the same measurements and indices the average V. is: Early 5.39, Middle 5.32, and Late 5.70, reversing the variability shown by the Standard Deviation. By either method the variability seems amazingly similar.

It is not feasible to compare directly average Standard Deviations unless the series are approximately equal in size, and unless identical measurements and indices are used. For these reasons, the variability can be compared only with the average of North American Indian male crania for a limited number of measurements and indices in terms of the Mean Sigma Ratio (Howells, 1936, p. 594). The Mean Sigmas for a large group of cranial series have been calculated by Stewart (Stewart, 1943, p. 265) and a Mean Sigma Ratio of 94.0 for the measurements and indices used was established for North American males. The Mean Sigma Ratios of the Valley series for the same measurements and indices are: Early 111.2, Middle 101.8, and Late 103.3, indicating a variability somewhat higher than average. The Mean Sigma Ratio of male crania from Indian Knoll (Snow, *op. cit.*, p. 450) is 98.3, and since Snow considers this a highly homogeneous population, the relatively high ratios of the Valley series may be due to the small number of individuals represented.

#### Post-Cranial Measurements and Observations

The post-cranial measurements and indices show very few significant differences. Differences at a significant level from seventy-eight measurements and indices are as follows:

	<u>No.</u>	<u>Percent</u>
Early - Middle	4	5.13
Middle - Late	0	0
Early - Late	11	14.10

A more detailed listing illustrates the same general trends shown in the crania:



d/ $\sigma$ d	<u>Early-Middle</u>		<u>Middle-Late</u>		<u>Early-Late</u>	
	No.	Percent	No.	Percent	No.	Percent
0 - 1	34	43.59	44	56.41	23	29.49
1 - 2	23	29.49	23	29.49	25	32.05
2 - 3	17	21.79	11	14.10	19	24.36
3 - x	<u>4</u>	5.13	<u>0</u>	0	<u>11</u>	14.10
	78		78		78	

The measurements that show significance in Early-Middle and Early-Late do not seem to follow any apparent pattern.

#### Early - Middle

<u>Measurement or Index</u>	<u>Difference Middle from Early</u>	<u>d/<math>\sigma</math>d</u>
Right Tibia, Least Circumference	-4.02	3.95
Left Tibia, Least Circumference	-3.28	3.57
Right Humerus, Maximum Length	-4.24	3.47
Sagittal Diameter of Pelvic Inlet	-6.76	3.01

Except for a constant decrease in size, there seems to be no reason for any such special grouping of these measurements.

The statistically significant differences between Early and Late are equally random.

#### Early - Late

<u>Measurement or Index</u>	<u>Difference Late from Early</u>	<u>d/<math>\sigma</math>d</u>
✓ Left Femur, Maximum Length	-10.33	3.17
Right Femur, Head Diameter	-1.87	3.56
Left Femur, Head Diameter	-2.13	4.25
Left Femur, Sub-Troch. Diam., Lateral	-1.51	3.32
Left Femur, Mid-Shaft Diam., Lateral	-1.10	3.49
Right Tibia, Least Circumference	-3.97	3.94
Left Tibia, Least Circumference	-3.12	3.15
Left Innominate, Height	-9.47	3.45
Right Femur, Middle Index	-3.82	3.17
Left Humerus, Humero-Femoral Index	+2.03	4.45
Sacral Index	+9.64	4.08

The differences show a decrease in size in Late, but it must be emphasized that unless paired measurements and indices show approximately equivalent differences, any conclusions drawn from the right or left side only would be highly tentative.

Post-cranial observations are also more difficult to interpret than cranial observations. Because of this uncertainty only the general trends from Early to Late will be summarized below:

### Tendencies in Morphological Post-Cranial Differences

#### From Early to Late

1. Reduction in size of many muscle attachments.
2. Femur mid-shaft shape becomes generally prismatic.
3. Torsion of femoral head becomes slightly more pronounced.
4. Pelvis becomes more feminine in some characteristics.

The over-all post-cranial impression is one of remarkable similarity when contrasted with the cranial differences.

There are no published data with which to calculate the Mean Sigma Ratios of post-cranial material, so estimates of the relative variability of the series can be indicated only by the average Standard Deviation and Coefficient of Variability. The average Standard Deviation for seventy-eight measurements and indices is: Early 6.55, Middle 7.45, and Late 7.29. The average Coefficient of Variability for the same measurements and indices is: Early 5.26, Middle 5.84, and Late 6.27

### Morphological Types

After the statistical compilation on a chronological basis was completed and it became apparent that assessment of inter-horizon differences would be difficult from that approach, the better preserved crania were segregated on a morphological basis without reference to cultural period. This sorting was largely based on facial characteristics and the skull vault as viewed from the front. The categories decided upon are rough and subjective and the results should, therefore, be taken as tentative and suggestive. No statistical validation of these typings was attempted, since this would not be feasible in view of the small size of the series. A deliberate attempt was made to fit all complete crania into one or another of the types wherever possible.

A brief and general description and illustration of each of the types follows:

#### The Long-Faced Type

This morphological variant is characterized by an absolutely long and relatively narrow facial structure. A considerable proportion of the facial length is contributed by a mandible high at the symphysis and often with a pointed chin. The nasal aperture is variable, but appears slightly longer and narrower than in the other types. Orbits are high and show slightly more inclination. Malars are medium to large with the latter predominating. Brow-ridges are quite variable, ranging from a

trace to a well-defined eminence. The skull vault appears somewhat narrower from the front than is characteristic of the other types. For illustration of this type see Plate 1.

#### The Large Broad-Faced Type

This group shows a massiveness in all dimensions. Facial height is great, but the extremely massive mandibular and malar breadths give an appearance of a square facial cast not found in the previous type. The orbits appear more rectangular due to great width. Brow-ridges are uniformly large and foreheads retreating, although vault height is high. Malars are very massive with both anterior and lateral projection. Skull breadth from the front is more apparent than in the Long-Faced Type. For illustration see Plate 1.

#### The Small Short-Faced Type

This type may be only a variant of the last group, but it presents a certain amount of difference in facial appearance. Facial height is not excessive and when coupled with broad facial breadth, it makes a distinctively short and broad face. Malars seem very large for the rest of the skull and this type often shows considerable ruggedness of facial countenance. Orbits are somewhat more square than for the Large Broad-Faced Type. For illustration see Plate 1.

#### The Round-Vaulted Type

This group differs from the previously described types in several particulars. Most conspicuous is the prominence of the brain case over the face when viewed from the front. The large bulbous parietal swellings overshadow the lateral projection of the malars and mandible. On the whole there is a lack of ruggedness to the facial region which is prominent in the preceding types. Orbits are very high and often have considerable inclination. For illustration see Plate 2.

#### The Narrow-Jawed Type

This group exhibits the distinctive characteristic of a lack of gonial flare which is common to all the other types. It gives the face a very different over-all appearance and since it occurs with relatively narrow skulls, it contrasts sharply with the Round-Vaulted Type. Orbits are somewhat variable but usually appear to be relatively low. The lateral projection of the malars is emphasized by the narrow gonial and parietal dimensions. For illustration see Plate 2.

#### The Facially Intermediate Type

A small group of crania, mainly from one site, appear to be intermediate between the Long-Faced and Small Short-Faced Types but could not be placed in either. The resemblance within the group was sufficiently strong to warrant giving them a separate category of undetermined affinities. For illustration see Plate 2.

After the crania were sorted morphologically, a tabulation by horizon was made to determine what groupings were present. Only 56.5 percent of the Early Horizon crania were in sufficiently good condition to be sorted by morphological type. The two later periods were in better condition with 90.5 percent of the Middle Horizon crania and 85.5 percent of the Late Horizon crania represented in the types. The results are shown below:

Morphological Groupings by Horizon

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
Long-Faced Type	5	19.23	20	41.67	7	20.00
Large Broad-Faced Type	10	38.48	6	12.50	2	5.71
Small Short-Faced Type	4	15.38	16	33.33	3	8.57
Round-Vaulted Type	1	3.85	2	4.17	14	40.00
Narrow-Jawed Type	2	7.69	2	4.17	9	25.71
Facially Intermediate Type	<u>4</u>	15.38	<u>2</u>	4.17	<u>0</u>	0
	26		48		35	

The differences in the frequency of the various types, although based on subjective groupings and small series, are partially reinforced by the independent metrical and morphological investigations by horizons. The general decrease in absolute measurements in Middle as contrasted with Early may be due to the relative decrease of the Large Broad-Faced Type and the increase in the Long-Faced and Small Short-Faced varieties. The changes noted from Middle to Late, and those manifest between Early and Late, are possibly due to the decrease in the Large Broad-Faced Type and the appearance in strength of the Round-Vaulted group. Although it is completely unverifiable, there may be a possibility that the Facially Intermediate Type is the result of crossing between the Long-Faced and Small Short-Faced Types, and that the Narrow-Jawed variant similarly represents crossing of the Long-Faced and Round-Vaulted Types.

Pathology

The most common pathological changes found in the series are arthritic lipping at the articular surfaces of the long bones and the glenoid fossa, vertebral lipping and erosion of the vertebral centra, and exostoses of the auditory meatus. The occurrence of these and some less frequent pathologies are given below:

	Early		Middle		Late	
	No.	Percent	No.	Percent	No.	Percent
Arthritic changes	8	17.4	10	18.9	15	36.6
Marked vertebral lipping	9	19.6	3	7.9	10	25.7
Ear exostoses	9	19.6	8	15.1	5	12.2
Periosteal inflammation	0	0	1	2.6	3	7.7
Traumatic cranial fracture	1	2.2	1	1.9	1	2.4
Imbedded projectile point	<u>2</u>	4.4	<u>1</u>	2.6	<u>3</u>	7.7
	29		24		37	

In general, there seems to be a somewhat higher incidence of pathology in the Late Horizon, although a more detailed analysis might indicate that the differences recorded here are due to sampling errors and poor preservation in the Early and Middle series.

#### Comparisons With Other Cranial Series

Some measurements and observations on the Early Series were published recently (Newman, R. W., 1949, pp. 49-50), but the Middle and Late Series have not been reported on previously except for cranial and nasal indices. Fenenga (Lillard, Heizer, and Fenenga, *op. cit.*, p. 73) compiled cranial and nasal indices for a large series of over two hundred individuals from eight sites treated in this study, but these included both males and females and his figures are therefore not strictly comparable to the male means given here. Inclusion of the females resulted in slightly larger differences between horizons than were provided by only the male crania.

Gifford (1926, pp. 241-248) presented data on a series of about forty-three males from the San Joaquin Valley and Delta Region. None of these crania were included in the series employed here, and all specimens utilized here were excavated since his publication. Gifford's series will be compared metrically with the Early, Middle, and Late Series below. No post-cranial measurements were given.

It is difficult to find series for comparison which are segregated on a chronological level in Western North America. Stewart's material from the deep levels of Buena Vista Lake (Stewart, 1941, pp. 176-177) is too scanty and fragmentary to make comparisons valid, and Roger's Oak Grove and Hunting People series from Santa Barbara are not only small but have practically no published measurements (Rogers, 1929, pp. 422-431). It was necessary to rely almost entirely on the same data employed by von Bonin and Morant (1938, pp. 94-128). This material was not segregated rigorously as to chronological level and was measured by different investigators but it remains the principal source of data for this area.

Since von Bonin and Morant had previously examined the available series statistically by the Coefficient of Racial Likeness, the same test was employed here in the hope of gaining comparability. The Coefficient of Racial Likeness has been severely criticized by Seltzer (1937, pp.

101-109) for its obvious short-comings and the results presented here are far from satisfactory. The Coefficient theoretically varies from zero upward, with low values indicating greater likeness than higher values.

The Reduced Coefficient was calculated between the Central Valley Horizon Series with the following results:

Early - Middle	9.48	+ 0.54	(21 measurements and indices)
Middle - Late	16.04	+ 0.48	(21 measurements and indices)
Early - Late	27.64	+ 0.60	(21 measurements and indices)

The trend of these figures is compatible with the previous statistical analysis. Von Bonin and Morant (op. cit., p. 126) suggest omitting all coefficients greater than 13 in classification of series, but this would leave only the Early - Middle connection as showing any genetic relationship. This is contrary to all the evidence presented here and no single level of significance appears justified.

Reduced Coefficients with other comparable series are shown in Table 3. The coefficients are extremely large in every instance and it hardly seems possible to draw more than very tentative conclusions from them.

The Central California series in Table 3 is from Gifford (op. cit., p. 242) and consists almost entirely of Late Horizon crania with a few Middle Horizon specimens. The almost equal coefficients between his series and Middle and Late are difficult to understand. The San Francisco Bay series (ibid., p. 242) contains an unknown but probably large number of Middle Horizon crania from that area which may explain the relatively low coefficient found with Middle.

One of the most puzzling portions of the table is the comparison with Hrdlička's Pre-Koniag and Koniag material. The low coefficients between the Valley series and Pre-Koniag would be very suggestive if the Late Horizon series did not show almost as much resemblance to Koniag. The Koniag series differs from Pre-Koniag in almost the same manner in which the Late Horizon crania differ from the Middle Horizon crania, namely, in a general decrease in length and height dimensions accompanied by an increase in breadth dimensions. The resulting combination resembles the Late Series in indices but is markedly different from the Early and Middle Series indices.

The very large coefficients found in comparing the Valley series with other groups were due to the general excess in over-all dimensions present in the former. This is probably due to the bias toward masculinity previously referred to. Consequently, the results are not closely comparable in magnitude to the coefficients calculated by von Bonin and Morant and the compilation in Table 3 has only internal consistency.

One of the conspicuous traits of the California tri-horizon series is the absolute as well as relative high-headedness. This is reflected

	Early	Middle	Late
	$\bar{n}$	50.0	38.2
Central California <sup>1</sup>	45.26 ± 0.72 (13)	28.59 ± 0.56 (13)	26.05 ± 0.54 (13)
Northern California <sup>1</sup>	86.98 ± 0.68 (13)	36.79 ± 0.52 (13)	44.03 ± 0.60 (13)
Santa Barbara County <sup>1</sup>	115.44 ± 0.74 (12)	66.33 ± 0.59 (12)	102.57 ± 0.67 (12)
San Francisco Bay <sup>1</sup>	66.21 ± 0.54 (14)	28.81 ± 0.39 (14)	63.08 ± 0.46 (14)
Utah Basketmaker <sup>1</sup>	108.33 ± 0.75 (15)	60.94 ± 0.61 (15)	129.27 ± 0.68 (15)
Pecos, Series "A" <sup>1</sup>	44.83 ± 0.50 (15)	26.47 ± 0.44 (15)	27.47 ± 0.51 (15)
Arikara <sup>1</sup>	47.74 ± 0.69 (12)	38.30 ± 0.60 (12)	59.32 ± 0.63 (12)
Indian Knoll <sup>2</sup>	71.31 ± 0.39 (18)	45.92 ± 0.26 (18)	80.22 ± 0.33 (18)
Pre-Koniag <sup>3</sup>	32.02 ± 0.53 (12)	22.69 ± 0.49 (12)	24.09 ± 0.57 (12)
Koniag <sup>3</sup>	149.60 ± 0.73 (12)	101.17 ± 0.55 (12)	37.59 ± 0.64 (12)

$\bar{n}$  = Average number of individuals available for characters used.  
 ( ) = Number of cranial measurements and indices compared.

1. Calculated from data in von Bonin and Morant, 1939, pp. 98, 109.
2. Calculated from data in Snow, 1948, pp. 440-444.
3. Calculated from data in Hrdlička, 1944, p. 410.

Table 3. Reduced Coefficients of Racial Likeness With Comparable Cranial Series.

in the calculated cranial capacities and cranial modules and also in comparisons of relative height with other groups. The Mean Height Index, calculated from the means of length, breadth, and height, is: Early 86.2 (39), Middle 86.4 (52), and Late 87.5 (41), each of which is very high for undeformed Indian crania. When compared with a Mean Height Index list of twenty-nine locations or tribes compiled by Stewart (1940, p. 27), the Late Series is exceeded by only 10.3 percent of the groups, the Middle Series by only 13.8 percent, and the Early Series by only 20.7 percent.

The stature of the three series is quite similar. Stature was calculated by the Lee-Pearson formula (Hooton, 1946, pp. 728-729) and its comparability to stature measured on the living is not certain in all groups. All three series can be generally said to be in the upper range of medium stature. There are taller living groups in the Southwest, such as the Mohave, Pima, Yuma, and Maricopa, but also a large number of shorter groups, including all the Pueblo peoples and most of the northern Mexican groups (Gabel, 1949, p. 17). There are few sizable series of living California Indian groups with which to compare the Valley series. Generally, the Central Valley people appear to have been taller than living groups in Northwest California, and closer to the coastal groups of Southern California (Gifford, op. cit., p. 232).

#### Summary and Conclusions

A collection of skeletal remains of one hundred and forty adult male individuals from the Central Valley has been compared and analyzed. The collection was divided into three series, Early, Middle, and Late, corresponding to three sequential cultural horizons established on archaeological evidence. Time estimates for the combined duration of the three horizons range from approximately two thousand to over four thousand years. The series were analyzed statistically for significant metrical differences which were found to be in a minority, approximately twenty percent between Early and Middle and between Middle and Late, and thirty percent between Early and Late. Observed changes in morphological observations largely paralleled the metrical differences. Variability showed no great contrast between the series. Post-cranial measurements and observations were remarkably uniform. The crania were segregated into six rough morphological types mainly on facial characteristics. These types were distributed in differing proportions by horizon, and suggested tentative explanations for the metrical and morphological changes between horizons. A brief and coarse grouping of skeletal pathology indicated a slightly greater incidence of pathological occurrences in the later periods.

Each of the three horizons was compared statistically with certain other cranial series by means of the Reduced Coefficient of Racial Likeness. The results were not entirely satisfactory. The lowest coefficient to the Early Series was with the Pre-Koniag crania from Kodiak Island. The Middle Series showed the greatest number of low coefficients,



resembling most closely series from the San Joaquin Valley, San Francisco Bay, Pecos Pueblo, and Pre-Koniag. The Late Series was closest to those of the San Joaquin Valley, Pecos Pueblo, and Pre-Koniag.

It is possible to approach the comparison of such skeletal series from two extremes: one, to emphasize the differences, and ascribe the similarities to the sharing of a common generalized stock; two, to emphasize the resemblances, and pass off the differences as possible sampling errors from inadequate data. This analysis has attempted to steer a middle course neither emphasizing nor depreciating any of the observed differences between horizons. Some are undoubtedly due to sampling errors and the inherent plasticity of the traits. These were pointed out in passing but a number of differences remain to be explained. There is no justification for assuming that all the cranial differences are due to chance variation, and the question remains as to how these are to be interpreted. Two possibilities present themselves in this regard. First, the differences are of a kind such as might appear through changes in a localized population over a long period of time without appreciable outside influence. Second, the differences are of a nature possibly attributable to the influx of a new group which intermingled with the indigenous population.

The first explanation is intimately connected with the time factor,

It would make a considerable difference in estimating what purely local changes may have taken place if the duration of the period covered were accurately known. A denial of appreciable genetic drift over a period of two thousand years could not apply with the same force to four thousand years. This explanation cannot be disproved but other interpretations seem more useful.

The second explanation of the partial replacement of populations from horizon to horizon can at least be supported by some positive evidence. It seems inconceivable that a complete replacement would still show such a small percentage of significant differences between periods, and the continuity of many of the cultural items from Early through Late would argue against such major population replacement. The evidence from the morphological types, subjective as they may be, favors the hypothesis that each horizon may have seen a new group enter and mix with the preceding people. In no case does this new group form as much as fifty percent of the population in the next horizon. The observed grouping of morphological types by horizon would seem to indicate that the new group entering with the Middle period was mainly of the Long-Faced Type and the new group in Late times was of the Round-Vaulted variety.

The results of this investigation have not always been clear-cut in all details. This limitation is shared with similar investigations known to the author and is attributable not only to the sparsity of good material but also the enormous complexity of the largely unknown genetic processes involved. A study of many of the measurements and indices produced negligible results, especially in regard to the post-cranial data. Future

studies on the area may profit from this analysis, however, and achieve better results by concentrating on more limited traits and aspects of the problem.

Table 4

## TABULATION OF CRANIAL MEASUREMENTS AND INDICES.

	No.	Range	Mean	S.E.	d/ $\sigma$ d	S.D.	S.E.	V.	S.E.
<b>Glabello-Occipital Length:</b>									
Early	43	174-203	190.45	0.98	E-M 3.81	6.38	0.70	3.35	0.36
Middle	53	174-204	185.56	0.84	M-L 3.16	6.06	0.59	3.27	0.33
Late	42	170-194	181.60	0.88	E-L 6.73	5.64	0.62	3.11	0.34
<b>Maximum Width:</b>									
Early	43	134-154	144.08	0.81	E-M 1.84	5.23	0.57	3.63	0.39
Middle	53	131-155	142.16	0.67	M-L 3.98	4.82	0.47	3.39	0.33
Late	40	136-160	146.25	0.78	E-L 1.92	4.88	0.55	3.34	0.37
<b>Basion-Bregma Height:</b>									
Early	30	135-156	145.90	1.01	E-M 3.48	5.44	0.71	3.73	0.48
Middle	49	130-157	141.56	0.75	M-L 1.89	5.16	0.53	3.65	0.37
Late	40	135-154	143.48	0.65	E-L 2.10	4.09	0.46	2.84	0.32
<b>Auricular Height:</b>									
Early	31	115-133	124.05	0.83	E-M 1.00	4.57	0.59	3.68	0.47
Middle	52	114-137	123.00	0.64	M-L 2.28	4.58	0.45	3.73	0.37
Late	38	117-135	125.16	0.69	E-L 1.78	4.22	0.49	3.37	0.39
<b>Minimum Frontal Diameter:</b>									
Early	41	88-105	96.99	0.64	E-M 0.44	4.02	0.45	4.15	0.46
Middle	52	86-105	96.62	0.56	M-L 1.93	4.00	0.40	4.14	0.41
Late	41	89-108	98.39	0.67	E-L 1.51	4.21	0.47	4.28	0.47
<b>Maximum Bizygomatic Diameter:</b>									
Early	20	134-153	143.40	1.33	E-M 0.99	5.78	0.94	4.03	0.64
Middle	47	132-156	142.02	0.71	M-L 1.24	4.80	0.50	3.38	0.35
Late	34	133-153	143.32	0.75	E-L 0.06	4.32	0.53	3.01	0.38
<b>Gnathion-Nasion Height:</b>									
Early	22	109-140	126.04	1.60	E-M 2.35	7.33	1.13	5.82	0.88
Middle	51	105-133	121.99	0.90	M-L 1.41	6.35	0.64	5.20	0.51
Late	34	110-136	123.14	1.28	E-L 1.42	7.35	0.90	5.97	0.72

Table 4 cont'd.

	No.	Range	Mean	S.E.	d/sd	S.D.	S.E.	V.	S.E.
<b>Prosthion-Nasion Height:</b>									
Early	26	62-85	76.35	1.06	E-M 1.83	5.31	0.75	6.96	0.97
Middle	50	63-83	74.30	0.59	M-L 0.91	4.16	0.42	5.61	0.56
Late	38	66-85	75.18	0.79	E-L 0.90	4.81	0.56	6.40	0.73
<b>Basion-Nasion:</b>									
Early	30	99-114	106.83	0.68	E-M 3.54	3.68	0.48	3.45	0.45
Middle	50	98-117	103.70	0.55	M-L 0.13	3.86	0.39	3.86	0.38
Late	40	96-111	103.60	0.54	E-L 3.77	3.36	0.38	3.24	0.36
<b>Basion-Prosthion:</b>									
Early	24	91-112	104.00	1.02	E-M 1.75	4.91	0.72	4.82	0.70
Middle	48	90-116	101.96	0.65	M-L 0.49	4.45	0.46	4.36	0.45
Late	38	97.109	102.40	0.57	E-L 1.48	3.47	0.40	3.39	0.39
<b>Nasal Height:</b>									
Early	31	48-63	53.03	0.56	E-M 2.00	3.09	0.40	5.82	0.74
Middle	53	43-58	51.76	0.36	M-L 0.58	2.63	0.26	5.08	0.49
Late	38	47-59	52.10	0.48	E-L 1.27	2.91	0.34	5.58	0.64
<b>Nasal Breadth:</b>									
Early	30	21-29	26.47	0.32	E-M 0.38	1.71	0.22	6.45	0.83
Middle	51	23-31	26.33	0.21	M-L 2.88	1.51	0.15	5.74	0.56
Late	38	21-30	25.29	0.31	E-L 2.62	1.91	0.22	7.55	0.87
<b>Right Orbit Height:</b>									
Early	29	32-40	35.93	0.37	E-M 0.20	1.97	0.26	5.49	0.72
Middle	49	31-41	35.73	0.30	M-L 0.11	2.11	0.22	5.90	0.60
Late	38	32-40	35.68	0.32	E-L 0.51	1.96	0.23	5.49	0.63
<b>Left Orbit Height:</b>									
Early	29	32-38	35.28	0.34	E-M 1.28	1.80	0.24	5.10	0.67
Middle	52	32-41	35.87	0.29	M-L 0.05	2.06	0.20	5.74	0.55
Late	37	33-40	35.89	0.33	E-L 1.27	1.97	0.23	5.48	0.64

Table 4 cont'd.

	No.	Range	Mean	S.E.	d/d	S.D.	S.E.	V.	S.E.
<b>Right Orbit Breadth</b>									
Early	27	37-43	40.07	0.26	E-M 0.18	1.33	0.18	3.32	0.45
Middle	47	38-43	40.68	0.21	M-L 0.20	1.42	0.15	3.49	0.36
Late	37	37-45	40.00	0.27	E-L 0.02	1.64	0.19	4.10	0.48
<b>Left Orbit Breadth:</b>									
Early	28	36-43	39.43	0.28	E-M 0.26	1.45	0.20	3.68	0.49
Middle	51	38-44	40.29	0.19	M-L 0.19	1.36	0.14	3.37	0.33
Late	37	36-44	39.68	0.26	E-L 0.07	1.58	0.19	3.98	0.46
<b>Interorbital Breadth:</b>									
Early	25	21-30	25.80	0.45	E-M 0.50	2.19	0.32	8.49	1.20
Middle	49	22-31	25.06	0.28	M-L 0.79	1.95	0.20	7.78	0.79
Late	37	19-30	24.68	0.42	E-L 1.78	2.52	0.130	10.20	1.19
<b>Biorbital Breadth:</b>									
Early	24	92-109	101.50	0.82	E-M 0.20	3.92	0.58	3.86	0.56
Middle	49	95-111	101.68	0.50	M-L 1.05	3.44	0.35	3.38	0.34
Late	37	93-107	100.92	0.50	E-L 0.64	3.02	0.36	2.99	0.35
<b>Nasalia Upper Breadth:</b>									
Early	34	8-17	12.88	0.34	E-M 1.32	1.94	0.24	15.07	1.83
Middle	52	6-21	13.63	0.40	M-L 3.01	2.83	0.28	20.75	1.99
Late	37	12-23	17.49	0.36	E-L 3.62	2.17	0.26	12.40	2.90
<b>Nasalia Lower Breadth:</b>									
Early	24	15-24	19.54	0.43	E-M 0.71	2.06	0.30	10.54	1.52
Middle	48	14-24	19.17	0.30	M-L 3.60	2.08	0.21	10.85	1.11
Late	37	12-23	17.49	0.36	E-L 3.62	2.17	0.26	12.40	1.40
<b>External Palatal Length:</b>									
Early	37	51-63	57.08	0.53	E-M 2.59	3.20	0.38	5.61	0.65
Middle	49	50-64	55.35	0.42	M-L 1.68	2.91	0.30	5.25	0.53
Late	38	51-61	56.39	0.45	E-L 0.99	2.73	0.32	4.84	0.56

Table 4 cont'd.

	No.	Range	Mean	S.E.	d/s <sup>d</sup>	S.D.	S.E.	V.	S.E.
<b>External Palatal Breadth:</b>									
Early	38	60-73	67.37	0.55	E-M 2.09	3.26	0.39	4.98	0.57
Middle	50	58-75	65.90	0.46	M-L 0.41	3.21	0.32	4.87	0.49
Late	38	59-72	65.61	0.55	E-L 2.39	3.35	0.39	5.21	0.60
<b>Foramen Magnum Length:</b>									
Early	29	35-48	38.93	0.49	E-M 0.63	2.57	0.34	6.60	0.87
Middle	49	34-43	38.29	0.30	M-L 4.02	2.05	0.21	3.35	0.54
Late	38	33-42	37.05	0.35	E-L 3.22	2.10	0.24	5.68	0.65
<b>Foramen Magnum Breadth:</b>									
Early	26	28-39	31.69	0.50	E-M 0.67	2.48	0.35	7.82	1.08
Middle	49	28-39	31.33	0.29	M-L 0.73	2.03	0.21	6.48	0.66
Late	38	26-39	31.00	0.35	E-L 1.17	2.14	0.25	6.91	0.79
<b>Nasion-Opisthion Arc:</b>									
Early	37	358-413	385.38	2.40	E-M 2.33	14.38	1.69	3.73	0.43
Middle	52	323-419	378.15	1.98	M-L 0.98	14.15	1.40	3.84	0.37
Late	38	355-407	375.65	1.84	E-L 3.23	11.18	1.29	2.96	0.34
<b>Transverse Arc:</b>									
Early	42	304-352	327.71	1.89	E-M 3.66	12.11	1.34	6.70	0.40
Middle	52	301-343	319.40	1.36	M-L 4.29	9.75	0.96	6.05	0.29
Late	40	308-354	327.56	1.25	E-L 0.07	11.13	0.89	6.40	0.38
<b>Maximum Circumference:</b>									
Early	40	483-553	526.12	2.23	E-M 2.40	13.96	1.58	2.65	0.30
Middle	52	493-563	518.73	2.09	M-L 1.01	14.96	1.48	2.88	0.28
Late	38	490-546	515.53	2.37	E-L 3.26	14.45	1.68	2.80	0.32
<b>Condyllo-Symphysial Length:</b>									
Early	34	100-122	112.68	0.95	E-M 1.76	5.43	0.67	4.82	0.58
Middle	52	100-119	110.89	0.63	M-L 0.41	4.46	0.44	4.03	0.140
Late	39	97-126	111.37	1.06	E-L 0.91	6.53	0.75	5.86	0.66

Table 4 cont'd.

	No.	Range	Mean	S.E.	d/ $\sigma_d$	S.D.	S.E.	V.	S.E.
<b>Bicondylar Width:</b>									
Early	27	119-145	130.80	1.30	E-M 0.32	6.61	0.92	5.06	0.69
Middle	37	120-151	130.18	1.15	M-L 0.20	6.90	0.81	5.30	0.62
Late	35	118-141	129.88	0.90	E-L 0.62	5.25	0.64	4.04	0.48
<b>Height of Symphysis:</b>									
Early	40	33-48	40.00	0.56	E-M 4.52	3.48	0.39	8.70	0.97
Middle	52	32-44	37.88	0.37	M-L 0.67	2.64	0.26	6.96	0.68
Late	40	33-43	37.50	0.43	E-L 3.54	2.71	0.31	7.22	0.81
<b>Diagonal Width:</b>									
Early	36	96-124	110.56	1.06	E-M 3.60	6.26	0.75	5.66	0.67
Middle	49	95-123	105.81	0.82	M-L 0.54	5.65	0.58	5.34	0.54
Late	38	93-121	105.13	0.98	E-L 3.76	5.96	0.69	5.67	0.65
<b>Height of Ascending Ramus</b>									
Early	38	52-74	61.82	0.83	E-M 1.35	5.04	0.59	8.15	0.94
Middle	52	49-70	60.31	0.74	M-L 2.08	5.27	0.52	8.74	0.86
Late	39	52-75	62.45	0.66	E-L 0.63	4.10	0.47	6.58	0.74
<b>Minimum Breadth of Ascending Ramus:</b>									
Early	45	30-40	36.18	0.35	E-M 2.02	2.29	0.24	6.51	0.69
Middle	52	29-41	35.19	0.34	M-L 2.35	2.46	0.24	6.98	0.68
Late	40	32-42	36.35	0.35	E-L 0.34	2.19	0.25	6.02	0.67
<b>Mean Angle Lower Jaw:</b>									
Early	38	103-132	121.08	0.93	E-M 1.36	5.65	0.66	4.67	0.54
Middle	52	108-132	119.46	0.76	M-L 0.63	5.40	0.53	4.52	0.44
Late	38	106-128	118.76	0.78	E-L 1.91	4.76	0.55	4.01	0.46
<b>Masion-Prosthion Angle:</b>									
Early	28	83-93	88.11	0.48	E-M 4.20	2.46	0.34	2.79	0.37
Middle	48	82-90	85.81	0.31	M-L 2.25	2.11	0.22	2.46	0.25
Late	38	77-90	84.63	0.44	E-L 5.29	2.66	0.31	3.14	0.36

Table 4 cont'd.

	No.	Range	Mean	S.E.	$d/\sigma_d$	S.D.	S.E.	V.	S.E.
<b>Nasion-Nasospinale Angle:</b>									
Early	28	78-91	85.43	0.61	E-M 4.37	3.18	0.43	3.72	0.50
Middle	50	83-96	88.68	0.44	M-L 4.69	3.09	0.31	3.49	0.35
Late	38	79-92	85.58	0.49	E-L 0.20	3.01	0.35	3.52	0.40
<b>Cranial Capacity:</b>									
Early	34	1374-1793	1588.74	17.90	E-M 2.27	102.90	12.66	6.48	0.78
Middle	49	1404-1794	1541.00	12.39	M-L 1.90	85.80	8.75	5.57	0.56
Late	39	1405-1847	1576.50	14.05	E-L 0.54	86.70	9.94	5.50	0.62
<b>Cranial Index:</b>									
Early	41	66.5-85.6	75.78	0.55	E-M 0.62	3.48	0.39	4.59	0.51
Middle	52	70.4-85.6	76.20	0.42	M-L 7.03	3.01	0.30	3.95	0.39
Late	40	74.9-87.3	80.68	0.48	E-L 6.70	3.01	0.34	3.73	0.42
<b>Height-Length Index:</b>									
Early	30	71.4-83.9	76.83	0.53	E-M 1.16	2.88	0.38	3.75	0.48
Middle	48	69.2-83.3	76.03	0.43	M-L 4.60	2.92	0.30	3.84	0.39
Late	40	73.0-84.2	78.85	0.43	E-L 3.00	2.71	0.31	3.44	0.38
<b>Height-Breadth Index:</b>									
Early	30	95.4-108.1	101.20	0.59	E-M 1.66	3.19	0.42	3.15	0.41
Middle	48	92.5-109.0	99.76	0.58	M-L 2.02	3.95	0.41	3.98	0.40
Late	39	89.5-105.9	98.14	0.53	E-L 3.84	3.27	0.37	3.33	0.38
<b>Fronto-Parietal Index:</b>									
Early	41	62.8-72.6	67.52	0.34	E-M 0.74	2.16	0.24	3.20	0.35
Middle	52	63.8-73.5	68.20	0.77	M-L 0.80	5.46	0.54	8.02	0.79
Late	40	62.2-73.0	67.42	0.47	E-L 0.17	2.96	0.33	4.39	0.49
<b>Auricular Height-Length Index:</b>									
Early	31	61.8-70.7	65.53	0.39	E-M 1.24	2.12	0.27	3.23	0.41
Middle	51	62.3-70.7	66.15	0.31	M-L 5.90	2.20	0.22	3.33	0.33
Late	38	64.9-80.1	69.66	0.55	E-L 5.88	3.36	0.39	4.82	0.55



Table 4 cont'd.

	No.	Range	Mean	S.E.	d/σ <sub>d</sub>	S.D.	S.E.	V.	S.E.
<b>Cranial Module:</b>									
Early	30	149.3-166.6	160.23	0.77	E-M 4.04	4.16	0.55	2.59	0.33
Middle	48	149.3-168.3	156.22	0.62	M-L 1.24	4.25	0.44	2.72	0.28
Late	39	147.6-167.7	157.31	0.61	E-L 3.02	3.75	0.43	2.38	0.27
<b>Facial Index:</b>									
Early	14	81.9-98.5	88.64	1.12	E-M 1.53	4.05	0.79	4.57	0.86
Middle	46	80.1-94.2	86.85	0.55	M-L 0.44	3.71	0.39	4.27	0.45
Late	31	77.1-96.2	86.39	0.97	E-L 1.38	5.32	0.69	6.17	0.78
<b>Upper Facial Index:</b>									
Early	17	48.3-59.2	53.74	0.71	E-M 0.93	2.84	0.50	5.28	0.91
Middle	44	48.6-59.0	53.05	0.37	M-L 1.11	2.52	0.26	4.56	0.49
Late	34	40.7-59.4	52.18	0.75	E-L 1.33	4.32	0.53	8.27	1.00
<b>Cranio-Facial Index:</b>									
Early	20	93.5-108.2	100.05	0.83	E-M 0.28	3.62	0.59	3.60	0.57
Middle	47	92.8-108.3	100.31	0.49	M-L 2.78	3.30	0.34	3.29	0.34
Late	34	89.4-105.1	98.06	0.66	E-L 1.86	3.81	0.47	3.89	0.47
<b>Gnathic Index:</b>									
Early	24	87.4-103.8	97.12	0.70	E-M 1.17	3.34	0.49	3.44	0.50
Middle	48	90.0-104.8	98.01	0.41	M-L 1.90	2.80	0.29	2.85	0.29
Late	38	91.9-107.7	99.32	0.58	E-L 2.40	3.50	0.41	3.53	0.40
<b>Nasal Index:</b>									
Early	29	39.6-56.9	50.05	0.74	E-M 1.16	3.90	0.52	7.69	1.01
Middle	51	41.4-58.1	51.02	0.47	M-L 2.60	3.32	0.33	6.52	0.65
Late	38	40.0-58.8	48.87	0.72	E-L 1.13	4.37	0.51	8.94	1.02
<b>Nasalia-Transverse Index:</b>									
Early	24	41.7-81.0	65.00	1.96	E-M 3.13	9.40	1.38	14.47	2.09
Middle	48	41.2-94.7	73.70	1.70	M-L 2.14	11.68	1.20	15.85	1.62
Late	37	35.3-92.9	67.90	2.16	E-L 0.93	12.97	1.55	19.10	3.26

Table 4 cont'd.

	No.	Range	Mean	S.E.	$d/\sigma_d$	S.D.	S.E.	V.	S.E.
<b>Left Orbital Index:</b>									
Early	28	82.0-100.0	89.86	0.93	E-M 0.86	4.82	0.66	5.36	0.72
Middle	50	78.6-100.0	88.95	0.60	M-L 1.70	4.20	0.42	4.72	0.47
Late	38	82.5-105.3	90.68	0.86	E-L 0.64	5.26	0.61	5.80	0.67
<b>Interorbital Index:</b>									
Early	23	21.1-28.9	25.33	0.38	E-M 1.61	1.76	0.27	6.96	1.03
Middle	47	22.0-27.9	24.65	0.23	M-L 0.40	1.54	0.16	6.25	0.64
Late	36	18.1-28.3	24.47	0.41	E-L 1.78	2.42	0.29	9.88	1.16
<b>External Palatal Index:</b>									
Early	37	106.4-135.2	118.95	1.19	E-M 0.13	7.15	0.84	6.01	0.70
Middle	50	106.9-137.2	119.15	0.92	M-L 1.93	6.43	0.65	5.40	0.54
Late	38	104.9-130.2	116.63	0.88	E-L 1.57	5.35	0.62	4.59	0.53
<b>Mandibular Index:</b>									
Early	27	69.9-95.2	86.26	1.17	E-M 0.93	5.96	0.83	6.91	0.94
Middle	36	76.0-91.8	85.00	0.77	M-L 0.33	4.56	0.55	5.37	0.63
Late	35	72.9-100.8	85.46	1.15	E-L 0.48	6.72	0.81	7.86	0.94
<b>Zygo-Gonial Index:</b>									
Early	18	72.7-81.9	77.06	0.55	E-M 2.82	2.27	0.39	2.94	0.49
Middle	45	64.9-84.1	74.46	0.54	M-L 1.74	3.56	0.38	4.78	0.50
Late	32	64.1-81.3	72.97	0.67	E-L 4.16	3.72	0.47	5.09	0.64
<b>Fronto-Gonial Index:</b>									
Early	33	99.0-124.5	114.33	1.11	E-M 3.45	6.28	0.78	5.49	0.68
Middle	48	95.0-120.8	109.67	0.82	M-L 1.87	5.64	0.58	5.14	0.52
Late	38	90.3-123.4	106.87	1.32	E-L 4.25	8.00	0.93	7.49	0.86

TABULATION OF POST-CRANIAL MEASUREMENTS AND INDICES.

Table 5

	No.	Range	Mean	S.E.	d/σ <sub>d</sub>	S.D.	S.E.	V.	S.E.
<b>Right Femur, Bicondylar Length:</b>									
Early	33	414-491	455.94	3.24	E-M 1.83	18.35	2.29	4.02	0.50
Middle	23	408-509	445.80	4.76	M-L 0.50	22.30	3.36	5.00	0.74
Late	33	413-482	448.56	3.26	E-L 1.61	18.45	2.31	4.11	0.51
<b>Left Femur, Bicondylar Length:</b>									
Early	37	418-491	459.84	2.69	E-M 251	16.17	1.90	3.52	0.41
Middle	31	412-512	449.34	3.91	M-L 0.21	21.40	2.76	4.76	0.61
Late	36	411-482	448.33	2.99	E-L 2.87	17.71	2.12	3.95	0.47
<b>Right Femur, Maximum Length:</b>									
Early	33	419-493	462.61	3.17	E-M 2.29	17.91	2.24	3.87	0.48
Middle	24	411-513	449.90	4.82	M-L 0.83	23.10	3.40	5.14	0.74
Late	33	417-486	454.62	3.33	E-L 1.74	18.85	2.36	4.14	0.51
<b>Left Femur, Maximum Length:</b>									
Early	36	422-495	464.36	2.86	E-M 2.11	16.95	2.02	3.65	0.43
Middle	30	417-516	454.17	4.03	M-L 0.19	21.70	2.85	4.78	0.62
Late	36	414-488	454.03	3.07	E-L 3.17	18.15	2.17	4.00	0.47
<b>Right Femur, Mid-Shaft Circumference:</b>									
Early	39	82-98	89.33	0.78	E-M 1.77	4.80	0.55	5.38	0.61
Middle	33	77-100	87.23	0.90	M-L 0.31	5.06	0.63	5.06	0.62
Late	39	78-96	87.59	0.77	E-L 1.59	4.73	0.54	5.40	0.61
<b>Left Femur, Mid-Shaft Circumference:</b>									
Early	40	83-100	89.38	0.72	E-M 2.44	4.48	0.51	5.02	0.56
Middle	34	78-100	86.85	0.74	M-L 0.83	4.22	0.52	4.86	0.59
Late	38	77-96	87.71	0.73	E-L 1.63	4.44	0.52	5.06	0.58
<b>Right Femur, Head Diameter:</b>									
Early	39	44-54	48.79	0.38	E-M 1.94	2.37	0.27	4.85	0.55
Middle	30	45-51	47.77	0.34	M-L 1.69	1.81	0.24	3.79	0.49
Late	36	43-51	46.52	0.36	E-L 3.46	2.14	0.26	4.56	0.54

Table 5 cont'd.

	No.	Range	Mean	S.E.	d/σ <sub>d</sub>	S.D.	S.E.	V.	S.E.
Left Femur, Head Diameter:									
Early	40	45-54	49.00	0.35	E-M 2.28	2.16	0.24	4.41	0.49
Middle	34	44-51	47.88	0.34	M-L 2.02	1.97	0.24	4.11	0.50
Late	38	43-51	46.87	0.36	E-L 4.25	2.17	0.25	4.63	0.53
Right Femur, Sub-Trochanteric Diameter, Antero-Posterior:									
Early	43	24-34	28.19	0.37	E-M 0.20	2.42	0.26	8.58	0.93
Middle	33	22-34	28.08	0.39	M-L 0.68	2.22	0.28	7.90	0.97
Late	38	23-33	28.45	0.44	E-L 0.49	2.66	0.31	9.36	1.07
Left Femur, Sub-Trochanteric Diameter, Antero-Posterior:									
Early	41	24-34	28.56	0.36	E-M 1.07	2.29	0.26	8.01	0.89
Middle	33	22-37	29.17	0.45	M-L 0.32	2.56	0.32	8.78	1.08
Late	38	24-35	28.97	0.43	E-L 0.73	2.60	0.30	8.98	1.03
Right Femur, Sub-Trochanteric Diameter, Lateral:									
Early	43	26-37	30.19	0.39	E-M 0.47	2.50	0.27	8.28	0.89
Middle	33	25-35	29.92	0.42	M-L 2.22	2.39	0.30	7.99	0.98
Late	38	23-33	28.68	0.37	E-L 2.79	2.28	0.26	7.95	0.91
Left Femur, Sub-Trochanteric Diameter, Lateral:									
Early	42	28-38	32.33	0.33	E-M 2.70	2.11	0.23	6.54	0.71
Middle	33	26-36	31.02	0.35	M-L 0.43	1.97	0.25	6.35	0.78
Late	38	27-34	30.82	0.31	E-L 3.32	1.90	0.22	6.16	0.71
Right Femur, Mid-Shaft Diameter, Antero-Posterior:									
Early	41	27-34	30.10	0.34	E-M 0.08	2.16	0.24	7.18	0.79
Middle	33	25-34	30.14	0.39	M-L 0.02	2.21	0.28	7.35	0.91
Late	39	26-34	30.13	0.34	E-L 0.06	2.08	0.24	6.91	0.78
Left Femur, Mid-Shaft Diameter, Antero-Posterior:									
Early	40	27-33	29.82	0.29	E-M 0.13	1.84	0.21	6.18	0.62
Middle	33	24-34	29.68	0.34	M-L 0.06	1.93	0.24	6.50	0.80
Late	38	26-34	29.71	0.33	E-L 0.25	2.00	0.23	6.73	0.77

Table 5 cont'd.

	No. Range	Mean	S.E.	d/ $\sigma$ d	S.D.	S.E.	V.	S.E.
<b>Right Femur, Mid-Shaft Diameter, Lateral:</b>								
Early	41 24-31	27.41	0.24	E-M 0.59	1.55	0.17	5.66	0.63
Middle	33 23-31	27.20	0.26	M-L 2.21	1.47	0.18	5.40	0.66
Late	39 23-29	26.41	0.24	E-L 2.94	1.48	0.17	5.61	0.64
<b>Left Femur, Mid-Shaft Diameter, Lateral:</b>								
Early	40 25-31	27.68	0.24	E-M 1.17	1.49	0.17	5.38	0.60
Middle	33 24-30	27.26	0.27	M-L 2.06	1.52	0.19	5.58	0.69
Late	38 24-29	26.58	0.20	E-L 3.49	1.20	0.14	4.52	0.52
<b>Right Tibia, Maximum Length:</b>								
Early	25 353-413	385.40	3.21	E-M 0.96	15.74	2.27	4.08	0.58
Middle	25 334-426	380.10	4.47	M-L 0.22	21.90	3.16	5.76	0.82
Late	29 336-414	381.46	4.09	E-L 0.74	20.68	2.89	5.43	0.71
<b>Left Tibia, Maximum Length:</b>								
Early	24 354-416	388.25	3.29	E-M 2.22	15.77	2.32	4.06	0.59
Middle	24 335-425	376.60	4.08	M-L 0.80	19.60	2.89	5.20	0.75
Late	36 333-414	380.69	3.15	E-L 1.61	18.60	2.22	4.89	0.58
<b>Right Tibia, Mid-Diameter, Antero-Posterior:</b>								
Early	32 31-38	34.25	0.33	E-M 1.41	1.84	0.23	5.33	0.67
Middle	31 29-40	33.53	0.39	M-L 0.19	2.12	0.27	6.32	0.80
Late	36 28-41	33.42	0.41	E-L 1.55	2.40	0.29	7.18	0.85
<b>Left Tibia, Mid-Diameter, Antero-Posterior:</b>								
Early	34 31-37	33.56	0.33	E-M 0.21	1.90	0.23	5.65	0.69
Middle	28 28-36	33.46	0.35	M-L 0.69	1.80	0.25	5.38	0.72
Late	38 28-38	33.13	0.32	E-L 0.93	1.96	0.23	5.92	0.68
<b>Right Tibia, Mid-Diameter, Lateral:</b>								
Early	32 20-26	21.97	0.25	E-M 0.51	1.40	0.18	6.37	0.80
Middle	31 18-25	21.76	0.33	M-L 0.39	1.79	0.23	8.23	1.05
Late	36 16-29	21.53	0.47	E-L 0.80	2.80	0.33	13.02	1.57

Table 5 cont'd.

	No. Range	Mean	S.E.	d/ $\sigma$ d	S.D.	S.E.	V.	S.E.
<b>Left Tibia, Mid-Diameter, Lateral:</b>								
Early	34 19-27	21.85	0.25	E-M 0.99	1.46	0.18	6.68	0.81
Middle	28 18-24	21.46	0.31	M-L 0.40	1.59	0.22	7.41	0.99
Late	38 16-29	21.24	0.41	E-L 1.24	2.52	0.29	11.85	1.36
<b>Right Tibia, Nutrient Foramen Diameter, Antero-Posterior:</b>								
Early	33 34-42	37.76	0.37	E-M 0.85	2.08	0.26	5.50	0.68
Middle	32 31-43	37.25	0.47	M-L 0.71	2.62	0.33	7.03	0.88
Late	37 32-41	37.30	0.43	E-L 0.10	2.57	0.30	6.82	0.79
<b>Left Tibia, Nutrient Foramen Diameter, Antero-Posterior:</b>								
Early	32 34-43	37.62	0.38	E-M 1.10	2.10	0.27	5.58	0.70
Middle	29 31-41	36.98	0.44	M-L 0.53	2.33	0.31	6.30	0.83
Late	37 32-41	37.30	0.41	E-L 0.57	2.48	0.29	6.65	0.77
<b>Right Tibia, Nutrient Foramen Diameter, Lateral:</b>								
Early	34 20-28	24.29	0.29	E-M 0.64	1.69	0.21	6.95	0.84
Middle	32 20-29	24.00	0.35	M-L 0.92	1.95	0.25	8.13	1.02
Late	37 19-29	23.49	0.42	E-L 1.54	2.50	0.29	10.64	1.24
<b>Left Tibia, Nutrient Foramen Diameter, Lateral:</b>								
Early	32 22-29	24.28	0.26	E-M 0.95	1.42	0.18	5.85	0.73
Middle	29 21-27	23.91	0.29	M-L 1.16	1.55	0.21	6.48	0.85
Late	37 18-29	23.32	0.39	E-L 1.98	2.32	0.27	9.95	1.16
<b>Right Tibia, Least Circumference:</b>								
Early	33 76-89	82.39	0.62	E-M 3.95	3.52	0.44	4.28	0.53
Middle	30 68-88	78.37	0.82	M-L 0.04	4.44	0.58	5.67	0.73
Late	36 68-88	78.42	0.78	E-L 3.94	4.32	0.52	5.51	0.65
<b>Left Tibia, Least Circumference:</b>								
Early	35 74-89	81.51	0.62	E-M 3.57	3.59	0.44	4.40	0.53
Middle	30 70-87	78.23	0.68	M-L 0.15	3.68	0.48	4.80	0.62
Late	38 69-88	78.39	0.76	E-L 3.15	4.61	0.54	5.88	0.67

Table 5 cont'd.

	No.	Range	Mean	S.E.	d/d	S.D.	S.E.	V.	S.E.
<b>Right Fibula, Maximum Length:</b>									
Early	13	357-400	374.38	4.32	E-M 1.73	14.95	3.05	3.99	0.78
Middle	20	329-418	363.50	4.22	M-L 1.24	18.40	2.98	5.06	0.80
Late	27	332-395	370.47	3.71	E-L 0.64	18.92	2.62	5.11	0.70
<b>Left Fibula, Maximum Length:</b>									
Early	12	354-400	378.76	4.57	E-M 2.52	15.18	3.24	4.00	0.82
Middle	19	332-417	362.40	4.03	M-L 1.39	17.10	2.85	4.72	0.77
Late	30	330-393	369.17	2.92	E-L 1.76	15.75	2.06	4.26	0.55
<b>Right Humerus, Maximum Length:</b>									
Early	29	295-357	329.41	2.58	E-M 3.47	13.63	1.82	4.14	0.60
Middle	30	297-369	325.17	2.88	M-L 1.09	15.50	2.03	4.76	0.62
Late	35	300-359	329.21	2.40	E-L 0.06	13.99	1.70	4.25	0.51
<b>Left Humerus, Maximum Length:</b>									
Early	25	296-345	327.20	2.72	E-M 0.82	13.30	1.92	4.07	0.58
Middle	23	296-364	323.63	3.43	M-L 0.68	16.10	2.43	4.98	0.74
Late	33	292-358	326.44	2.46	E-L 0.21	13.92	1.78	4.26	0.52
<b>Right Humerus, Head Diameter:</b>									
Early	31	45-53	48.74	0.36	E-M 0.38	2.00	0.26	4.10	0.52
Middle	31	44-53	48.53	0.41	M-L 2.12	2.26	0.29	4.65	0.59
Late	37	44-53	47.41	0.34	E-L 2.67	2.01	0.24	4.24	0.49
<b>Left Humerus, Head Diameter:</b>									
Early	28	41-54	48.46	0.54	E-M 0.77	2.81	0.38	5.80	0.78
Middle	26	44-52	47.92	0.44	M-L 1.69	2.22	0.31	4.63	0.64
Late	33	43-52	46.94	0.38	E-L 2.35	2.15	0.27	4.58	0.56
<b>Right Humerus, Minimum Shaft Circumference:</b>									
Early	40	58-74	65.12	0.58	E-M 0.45	3.60	0.41	5.53	0.62
Middle	33	58-72	64.74	0.60	M-L 2.37	3.41	0.43	5.27	0.65
Late	38	53-69	62.87	0.52	E-L 2.88	3.17	0.37	5.04	0.58

Table 5 cont'd.

	No.	Range	Mean	S.E.	d/ $\sigma$	S.D.	S.E.	V.	S.E.
<b>Left Humerus, Minimum Shaft Circumference:</b>									
Early	35	56-71	63.20	0.62	E-M 0.03	3.61	0.44	5.71	0.68
Middle	30	57-71	63.17	0.68	M-L 1.30	3.64	0.48	5.76	0.74
Late	35	57-69	62.09	0.50	E-L 1.39	2.91	0.35	4.69	0.56
<b>Right Radius, Maximum Length:</b>									
Early	20	238-285	259.25	2.89	E-M 1.84	12.60	2.04	4.86	0.77
Middle	20	233-284	252.00	2.66	M-L 1.00	11.60	1.88	4.60	0.73
Late	27	229-278	255.56	2.38	E-L 1.10	12.11	1.68	4.74	0.65
<b>Left Radius, Maximum Length:</b>									
Early	27	240-283	260.33	2.17	E-M 2.25	11.07	1.54	4.25	0.58
Middle	18	230-283	252.55	2.97	M-L 1.09	12.25	2.10	4.84	0.81
Late	29	233-278	256.62	2.20	E-L 1.24	11.63	1.55	4.53	0.60
<b>Right Ulna, Maximum Length:</b>									
Early	22	269-308	280.54	2.37	E-M 1.29	10.88	1.68	3.88	0.58
Middle	20	254-303	276.00	2.60	M-L 0.10	11.35	1.84	4.11	0.65
Late	24	252-298	276.38	2.65	E-L 1.16	12.71	1.87	4.60	0.66
<b>Left Ulna, Maximum Length:</b>									
Early	18	267-303	280.00	2.40	E-M 2.49	9.90	1.70	3.54	0.59
Middle	18	252-301	270.90	2.76	M-L 1.19	11.40	1.95	4.22	0.70
Late	28	246-296	275.28	2.35	E-L 1.40	12.20	1.66	4.43	0.59
<b>Right Innominate, Height:</b>									
Early	22	202-243	224.36	1.94	E-M 2.69	8.89	1.37	3.96	0.60
Middle	20	201-238	216.40	2.25	M-L 0.01	9.82	1.59	4.53	0.72
Late	29	197-236	216.38	1.86	E-L 2.93	9.85	1.32	4.55	0.60
<b>Left Innominate, Height:</b>									
Early	24	200-247	225.25	2.08	E-M 2.73	9.99	1.47	4.44	0.64
Middle	21	202-237	217.14	2.11	M-L 0.49	9.45	1.50	4.35	0.67
Late	27	197-239	215.78	1.81	E-L 3.45	9.24	1.28	4.28	0.58



Table 5 cont'd.

	No.	Range	Mean	S.E.	d/ $\sigma$ <sub>d</sub>	S.D.	S.E.	V.	S.E.
<b>Right Innominate, Breadth:</b>									
Early	20	146-172	162.50	1.32	E-M 1.42	5.73	0.93	3.52	0.56
Middle	17	151-175	159.68	1.49	M-L 0.68	6.33	1.05	3.96	0.68
Late	19	140-176	157.79	2.28	E-L 1.81	9.67	1.61	6.13	0.99
<b>Left Innominate, Breadth:</b>									
Early	24	146-177	161.62	1.40	E-M 1.50	6.74	0.99	4.17	0.60
Middle	18	150-173	158.50	1.52	M-L 0.39	6.29	1.08	3.97	0.66
Late	23	143-169	157.63	1.60	E-L 1.88	7.50	1.13	4.76	0.70
<b>Sagittal Diameter of Pelvic Inlet:</b>									
Early	14	102-126	113.64	1.78	E-M 3.01	6.40	1.26	5.82	1.10
Middle	21	94-120	106.88	1.40	M-L 0.47	6.25	0.99	5.85	0.50
Late	24	92-122	108.00	1.86	E-L 2.02	8.92	1.31	8.26	1.19
<b>Transverse Diameter of Pelvic Inlet:</b>									
Early	15	119-136	129.80	1.55	E-M 2.22	5.81	1.10	4.48	0.82
Middle	21	113-137	125.07	1.45	M-L 0.92	6.50	1.02	4.31	0.66
Late	24	108-140	127.00	1.50	E-L 1.24	7.22	1.06	5.68	0.82
<b>Right Innominate, Breadth of Ischiatic Notch:</b>									
Early	17	35-57	43.68	1.42	E-M 1.16	5.66	1.00	12.39	2.12
Middle	13	41-56	48.04	1.39	M-L 0.73	4.80	0.98	9.98	1.96
Late	33	35-60	45.65	1.09	E-L 0.02	6.16	0.77	13.48	1.66
<b>Left Innominate, Breadth of Ischiatic Notch:</b>									
Early	10	40-55	46.30	0.70	M-L 2.14	2.44	0.50	4.98	0.98
Middle	13	44-53	48.96	1.18		6.44	0.83	14.32	1.82
Late	31	32-62	44.95						
<b>Right Scapula, Morphological Breadth:</b>									
Early	3	158-164	159.00						
Middle	5	147-167	157.30						
Late	15	144-180	159.57	2.59				9.68	1.83
								6.07	1.11

Table 5 cont'd.

	No. Range	Mean	S.E.	d/ $\sigma$ d	S.D.	S.E.	V.	S.E.
Left Scapula, Morphological Breadth:								
Early	3 159-166	163.33						
Middle	5 159-178	164.90						
Late	15 146-171	157.43	1.85		6.92	1.31	4.39	0.80
Right Scapula, Morphological Length:								
Early	4 104-109	106.00						
Middle	12 99-114	105.66	1.29	M-L 1.81	4.28	0.91	4.06	0.83
Late	20 100-120	108.50	0.94		4.10	0.66	3.78	0.60
Left Scapula, Morphological Length:								
Early	8 102-115	107.88						
Middle	13 98-115	107.58	1.23	M-L 0.14	4.27	0.87	3.96	0.78
Late	19 99-113	107.37	0.91		3.88	0.65	3.61	0.59
Right Scapula, Infra-Spinous Fossa Breadth:								
Early	3 117-129	123.67						
Middle	7 116-130	122.78						
Late	17 107-134	119.08	1.96		7.84	1.38	6.58	1.13
Left Scapula, Infra-Spinous Fossa Breadth:								
Early	7 109-130	122.50						
Middle	9 113-133	125.61						
Late	17 113-131	120.85	1.38		5.54	0.98	4.58	0.79
Right Scapula, Supra-Spinous Fossa Breadth:								
Early	2 49-52	50.50						
Middle	7 49-63	54.79						
Late	16 42-77	58.25	2.09		8.09	1.48	13.89	2.46
Left Scapula, Supra-Spinous Fossa Breadth:								
Early	4 43-60	52.00						
Middle	5 47-62	54.10						
Late	15 44-63	55.70	1.25		4.67	0.88	8.38	1.53

Table 5 cont'd.

	No.	Range	Mean	S.E.	d/s d	S.D.	S.E.	V.	S.E.
<b>Right Clavicle, Maximum Length:</b>									
Early	6	145-171	154.50						
Middle	19	143-165	155.76	1.28	M-L 0.62	5.44	0.91	3.49	0.57
Late	30	140-182	157.10	1.53		8.22	1.08	5.23	0.67
<b>Left Clavicle, Maximum Length:</b>									
Early	5	144-168	157.30						
Middle	20	141-180	159.10	1.38	M-L 0.73	6.00	0.97	3.77	0.60
Late	28	146-185	160.75	1.65		8.58	1.16	5.34	0.71
<b>Right Clavicle, Mid-Shaft Circumference:</b>									
Early	12	34-41	38.58	0.58	E-M 0.28	1.93	0.41	5.00	1.02
Middle	20	34-45	38.3-	0.74	M-L 1.30	3.22	0.52	8.40	1.33
Late	35	31-45	37.03	0.61	E-L 1.42	3.58	0.42	9.59	1.15
<b>Left Clavicle, Mid-Shaft Circumference:</b>									
Early	11	37-42	39.36	0.47	E-M 1.67	1.49	0.33	3.79	0.81
Middle	22	33-43	37.73	0.65	M-L 1.76	2.97	0.46	7.87	1.19
Late	35	30-43	36.14	0.59	E-L 2.92	3.44	0.42	9.52	1.14
<b>Sacrum, Breadth:</b>									
Early	7	116-132	124.79						
Middle	21	105-131	120.98	1.59	M-L 0.04	7.11	1.12	5.88	0.91
Late	29	107-133	121.05	1.07		5.65	0.75	4.67	0.61
<b>Sacrum, Anterior Length:</b>									
Early	5	108-125	113.70						
Middle	20	83-137	115.25	3.04	M-L 2.28	13.25	2.15	11.50	1.82
Late	29	91-127	108.09	1.55		8.18	1.09	7.57	0.99
<b>Stature:</b>									
Early	43	162.0-175.1	169.01	0.57	E-M 1.78	3.69	0.40	2.18	0.22
Middle	38	157.8-180.0	167.24	0.83	M-L 0.61	5.04	0.59	3.01	0.31
Late	39	158.2-174.8	167.86	0.68	E-L 1.30	4.20	0.48	2.52	0.29

Table 5 cont'd.

	No.	Range	Mean	S.E.	d/σ <sub>d</sub>	S.D.	S.E.	V.	S.E.
<b>Right Femur, Index of Platymeria:</b>									
Early	43	72.7-123.1	93.78	1.39	E-M 0.02	9.04	0.99	9.63	1.04
Middle	33	81.8-114.3	93.73	1.45	M-L 2.37	8.23	1.02	8.78	1.08
Late	38	75.0-143.5	100.66	2.43	E-L 2.53	14.75	1.71	14.67	1.68
<b>Left Femur, Index of Platymeria:</b>									
Early	41	76.5-107.1	88.76	1.13	E-M 2.75	7.16	0.80	8.07	0.89
Middle	33	75.9-108.8	93.45	1.28	M-L 0.78	7.27	0.91	7.79	0.96
Late	38	72.7-125.0	94.39	2.03	E-L 2.91	12.32	1.43	12.94	1.48
<b>Right Femur, Middle Index:</b>									
Early	41	79.4-103.7	91.49	0.86	E-M 0.60	5.41	0.60	5.92	0.65
Middle	33	74.2-104.0	90.56	1.35	M-L 1.87	7.66	0.96	8.46	1.04
Late	39	78.1-100.0	87.67	0.84	E-L 3.17	5.20	0.60	5.93	0.67
<b>Left Femur, Middle Index:</b>									
Early	40	81.8-100.0	93.15	0.81	E-M 0.87	5.04	0.57	5.41	0.60
Middle	33	77.4-104.2	91.90	1.24	M-L 1.39	7.02	0.88	7.65	0.94
Late	38	72.2-103.7	89.53	1.16	E-L 2.58	7.08	0.82	7.92	0.91
<b>Right Femur, Pilastric Index:</b>									
Early	41	96.4-125.9	109.88	1.03	E-M 0.64	6.51	0.73	5.92	0.65
Middle	33	96.2-134.8	111.00	1.67	M-L 1.63	9.45	1.18	8.50	1.05
Late	39	100.0-128.0	114.28	1.11	E-L 2.91	6.82	0.78	5.96	0.68
<b>Left Femur, Pilastric Index:</b>									
Early	40	100.0-122.2	108.35	0.94	E-M 0.44	5.88	0.67	5.42	0.61
Middle	33	96.0-129.2	109.09	1.46	M-L 1.46	8.28	1.03	7.54	0.93
Late	38	93.1-126.9	111.84	1.25	E-L 2.25	7.60	0.88	6.79	0.78
<b>Right Femur, Index of Robusticity:</b>									
Early	33	111.8-141.2	126.70	1.04	E-M 1.05	5.87	0.73	4.64	0.57
Middle	23	110.2-134.7	124.94	1.35	M-L 0.88	6.35	0.96	5.08	0.75
Late	33	112.1-147.6	126.59	1.25	E-L 0.07	7.10	0.89	5.61	0.69

Table 5 cont'd.

	No.	Range	Mean	S.E.	$d/\sigma_d$	S.D.	S.E.	V.	S.E.
<b>Left Femur, Index of Robusticity:</b>									
Early	38	108.2-138.2	125.05	0.96	E-M 0.07	5.85	0.68	4.68	0.54
Middle	31	107.5-134.4	125.15	1.17	M-L 0.32	6.43	0.83	5.13	0.65
Late	36	113.5-138.6	125.61	0.89	E-L 0.41	5.25	0.63	4.18	0.48
<b>Right Tibia, Middle Index:</b>									
Early	32	55.3-72.7	64.12	0.69	E-M 0.32	3.84	0.49	5.99	0.75
Middle	31	54.6-75.0	64.50	0.98	M-L 0.14	5.35	0.69	8.30	1.05
Late	36	52.8-90.6	64.75	1.41	E-L 0.39	8.35	1.00	12.90	1.52
<b>Left Tibia, Middle Index:</b>									
Early	34	56.8-73.0	65.06	0.71	E-M 1.05	4.10	0.50	6.31	0.77
Middle	29	54.3-71.4	63.88	0.89	M-L 0.63	4.70	0.63	7.36	0.97
Late	38	51.4-85.3	64.74	0.98	E-L 0.26	5.98	0.70	9.24	1.06
<b>Right Tibia, Index of Platycnemia:</b>									
Early	33	54.8-71.0	64.15	0.66	E-M 0.47	3.75	0.47	5.85	0.72
Middle	31	53.5-70.7	63.66	0.80	M-L 1.04	4.39	0.57	6.90	0.88
Late	37	50.0-76.3	62.24	1.05	E-L 1.50	6.30	0.74	10.05	1.17
<b>Left Tibia, Index of Platycnemia:</b>									
Early	33	54.8-71.0	64.15	0.66	E-M 0.47	3.75	0.47	5.85	0.72
Middle	31	53.5-70.7	63.66	0.80	M-L 1.04	4.39	0.57	6.90	0.88
Late	37	50.0-76.3	62.24	1.05	E-L 1.50	6.30	0.74	10.05	1.17
<b>Left Tibia, Index of Platycnemia:</b>									
Early	32	57.9-71.4	64.94	0.66	E-M 0.72	3.66	0.46	5.63	0.70
Middle	29	56.1-74.3	64.16	0.88	M-L 0.85	4.66	0.62	5.82	0.76
Late	37	50.0-80.6	63.00	0.99	E-L 1.58	5.95	0.70	9.45	1.10
<b>Right Tibia, Length-Thickness Index:</b>									
Early	25	193.5-236.6	212.94	2.19	E-M 2.16	10.74	1.55	5.05	0.71
Middle	24	178.2-224.8	206.00	2.36	M-L 0.50	11.31	1.67	5.49	0.79
Late	28	186.8-224.1	204.54	1.81	E-L 2.98	9.39	1.28	4.59	0.61
<b>Left Tibia, Length-Thickness Index:</b>									
Early	24	193.6-230.6	209.37	2.26	E-M 2.40	10.86	1.60	5.18	0.75
Middle	24	178.0-223.0	202.87	1.49	M-L 1.50	10.32	1.05	5.15	0.74
Late	36	186.0-232.7	206.67	1.81	E-L 0.94	10.70	1.28	5.18	0.61

Table 5 cont'd.

	No.	Range	Mean	S.E.	d/σ <sub>j</sub>	S.D.	S.E.	V.	S.E.
<b>Right Tibia, Tibio-Femoral Index:</b>									
Early	22	78.0-88.5	84.77	0.55	E-M 1.48	2.53	0.39	2.98	0.45
Middle	18	80.6-85.7	83.72	0.40	M-L 2.47	1.66	0.28	1.98	0.33
Late	28	81.3-89.2	85.21	0.41	E-L 0.66	2.15	0.29	2.52	0.34
<b>Left Tibia, Tibio-Femoral Index:</b>									
Early	23	78.3-89.4	84.11	0.52	E-M 0.58	2.43	0.37	2.89	0.43
Middle	23	79.8-87.2	83.74	0.37	M-L 2.47	1.75	0.26	2.09	0.31
Late	34	81.0-90.3	85.03	0.35	E-L 1.53	2.02	0.25	2.39	0.29
<b>Right Humerus, Index of Robusticity:</b>									
Early	29	177.2-222.2	197.12	2.12	E-M 0.23	11.12	1.49	5.64	0.74
Middle	30	168.0-223.5	197.83	2.21	M-L 2.24	11.88	1.56	6.00	0.78
Late	35	158.7-213.0	191.36	1.89	E-L 2.03	11.03	1.34	5.76	0.69
<b>Left Humerus, Index of Robusticity:</b>									
Early	25	174.2-216.2	192.90	2.05	E-M 0.55	10.05	1.45	5.21	0.74
Middle	23	170.2-217.5	194.78	2.80	M-L 1.07	13.15	1.98	6.75	0.83
Late	33	170.4-208.8	191.50	1.64	E-L 0.54	9.26	1.16	4.83	0.60
<b>Right Humerus, Humero-Femoral Index:</b>									
Early	24	70.4-79.7	72.58	0.42	E-M 0.64	2.02	0.30	2.78	0.40
Middle	22	68.7-82.1	73.04	0.59	M-L 0.98	2.72	0.42	3.72	0.56
Late	30	71.4-77.4	73.67	0.34	E-L 2.04	1.85	0.24	2.51	0.32
<b>Left Humerus, Humero-Femoral Index:</b>									
Early	24	68.7-74.0	71.25	0.31	E-M 1.92	1.51	0.22	2.12	0.31
Middle	19	69.9-81.3	72.42	0.56	M-L 1.44	2.39	0.40	3.30	0.54
Late	32	69.2-77.8	73.28	0.32	E-L 4.45	1.80	0.23	2.46	0.31
<b>Right Radius, Humero-Radial Index:</b>									
Early	19	73.3-86.5	79.08	0.69	E-M 0.92	2.91	0.48	3.68	0.60
Middle	19	73.7-84.0	78.21	0.64	M-L 0.10	2.73	0.45	3.49	0.57
Late	25	75.1-83.0	78.14	0.37	E-L 1.28	1.81	0.26	2.32	0.33

Table 5 cont'd.

	No.	Range	Mean	S.E.	$d/\sigma_d$	S.D.	S.E.	V.	S.E.
<b>Left Radius, Humero-Radial</b>									
Early	21	75.7-85.4	79.93	0.58	E-M 1.38	2.61	0.41	3.27	0.50
Middle	13	76.3-83.2	78.69	0.66	M-L 0.41	2.30	0.47	2.92	0.57
Late	26	75.4-81.4	78.42	0.33	E-L 2.37	1.66	0.23	2.12	0.29
<b>Right Innominate, Breadth-Height Index:</b>									
Early	17	127.5-146.3	138.76	1.26	E-M 2.24	5.04	0.89	3.63	0.62
Middle	17	127.0-143.0	135.09	1.04	M-L 1.32	4.15	0.73	3.07	0.53
Late	18	129.0-149.3	137.22	1.23	E-L 0.97	5.08	0.87	3.70	0.62
<b>Left Innominate, Breadth-Height Index:</b>									
Early	19	128.2-145.2	138.47	1.12	E-M 1.31	4.76	0.79	3.44	0.56
Middle	16	128.0-142.5	136.38	1.01	M-L 0.39	3.90	0.71	2.86	0.51
Late	19	125.7-147.0	137.00	1.10	E-L 0.94	4.68	0.78	3.42	0.55
<b>Index of Pelvic Inlet:</b>									
Early	14	75.6-96.2	87.14	1.75	E-M 1.21	6.30	1.24	7.24	1.37
Middle	21	72.0-93.0	84.60	1.25	M-L 0.48	5.60	0.88	6.62	1.02
Late	24	71.4-100.7	85.58	1.59	E-L 0.63	7.61	1.12	8.89	1.27
<b>Right Scapula, Scapular Index:</b>									
Early	2	64.0-69.7	67.00						
Middle	5	65.5-70.1	67.00						
Late	14	60.6-72.2	68.43	0.87		3.15	0.62	4.61	0.87
<b>Left Scapula, Scapular Index:</b>									
Early	3	64.2-69.3	66.17						
Middle	4	60.1-69.2	65.75						
Late	13	64.3-72.3	68.12	0.64		2.20	0.45	3.23	0.63
<b>Right Scapula, Infra-Spinal Index:</b>									
Early	3	110.4-122.6	115.83						
Middle	7	110.4-123.8	115.64						
Late	17	100.9-124.1	109.47	1.41		5.64	1.00	5.15	0.88

Table 5 Cont'd.

	No.	Range	Mean	S.E.	d/σ <sub>d</sub>	S.D.	S.E.	V.	S.E.
<b>Left Scapula, Infra-Spinal Index:</b>									
Early	6	99.9-123.6	113.00						
Middle	8	106.6-124.3	116.50						
Late	16	105.4-119.1	112.06	1.224		4.81	0.88	4.29	0.76
<b>Right Scapula, Supra-Spinous Index:</b>									
Early	2	46.2-49.5	48.00						
Middle	7	43.2-57.3	51.36						
Late	16	40.4-68.8	53.62	1.74		6.73	1.23	12.55	2.22
<b>Left Scapula, Supra-Spinous Index:</b>									
Early	3	41.0-52.2	47.17						
Middle	5	44.3-57.9	50.50						
Late	15	43.2-57.3	51.97	1.06		3.96	0.75	7.62	1.39
<b>Right Clavicle, Length-Thickness Index:</b>									
Early	20	204.2-312.9	243.50	5.58	E-M 0.02	24.35	3.95	10.00	1.58
Middle	19	220.5-298.0	243.66	5.68	M-L 1.94	24.10	4.01	9.90	1.61
Late	30	200.2-281.0	230.65	3.93	E-L 1.94	21.12	2.78	9.16	1.18
<b>Left Clavicle, Length-Thickness Index:</b>									
Early	15	204.2-276.8	238.17	5.02	E-M 0.16	18.78	3.55	7.88	1.44
Middle	20	202.8-276.8	237.00	4.82	M-L 2.44	21.05	3.41	8.89	1.41
Late	28	196.2-256.4	223.57	3.13	E-L 2.59	16.28	2.21	7.28	0.97
<b>Sacral Index:</b>									
Early	16	90.4-111.8	102.62	1.75	E-M 1.02	6.79	1.24	6.62	1.17
Middle	20	91.0-140.9	106.25	2.85	M-L 1.96	12.42	2.01	11.70	1.85
Late	25	96.0-129.7	112.26	1.52	E-L 4.08	7.44	2.07	6.62	0.94



TABULATION OF CRANIAL MORPHOLOGICAL OBSERVATIONS.

1. Description:	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
Cranium	28	60.87	52	98.11	37	90.24
Calvarium	5	10.87	1	1.89	1	2.44
Calvaria	9	19.57	0	0	3	7.32
Calva	<u>4</u>	<u>8.70</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	46		53		41	
2. Condition:						
Poor	12	26.09	4	7.55	2	4.88
Fair	19	41.30	12	22.64	8	19.51
Good	<u>15</u>	<u>32.61</u>	<u>37</u>	<u>69.81</u>	<u>31</u>	<u>75.61</u>
	46		53		41	
3. Muscularity:						
Small	0	0	1	1.89	1	2.44
Medium	19	42.22	38	71.70	31	75.61
Large	<u>26</u>	<u>57.78</u>	<u>14</u>	<u>26.42</u>	<u>9</u>	<u>21.95</u>
	45		53		41	
4. Age by Suture Closure:						
Young Adult (21-35)	19	41.30	28	52.83	22	53.66
Middle-aged Adult (36-55)	25	54.35	25	47.17	19	46.34
Old Adult (56-75)	2	4.35	0	0	0	0
Very Old (76-x)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	46		53		41	
5. Deformation:						
None	42	93.33	49	92.45	15	36.59
Occipital	0	0	0	0	0	0
Right Occipital	3	6.67	1	1.89	16	39.02
Left Occipital	0	0	2	3.77	7	17.07
Lambdoid	0	0	1	1.89	3	7.32
Fronto-Occipital	0	0	0	0	0	0
Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	45		53		41	
6. Degree Deformation:						
None	42	93.33	49	92.45	15	36.59
Trace	2	4.44	2	3.77	18	43.90
Small	0	0	2	3.77	8	19.51
Medium	1	2.22	0	0	0	0
Pronounced	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	45		53		41	
7. Cause of Deformation:						
Artificial	2	100.00	4	100.00	23	88.46
Natural	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>	<u>11.54</u>
	2		4		26	

Table 6

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
8. Form:						
Ellipsoid	0	0	0	0	0	0
Ovoid	13	28.89	23	43.40	4	9.76
Spheroid	0	0	0	0	0	0
Pentagonoid	4	8.89	2	3.77	0	0
Rhomboid	4	11.11	8	15.09	0	0
Sphenoid	19	42.22	16	30.19	33	80.49
Brisoid	<u>4</u>	8.89	<u>4</u>	7.55	<u>4</u>	9.76
	45		53		41	
9. Brow Ridges:						
Median	32	71.11	37	69.81	40	97.56
Divided	12	26.67	16	30.19	0	0
Continuous	<u>1</u>	2.22	<u>0</u>	0	<u>1</u>	2.44
	45		53		41	
10. Brow Ridges Size:						
Trace	0	0	0	0	0	0
Small	2	4.35	5	9.43	2	4.88
Medium	17	36.96	23	43.40	27	65.85
Large	21	45.65	17	32.08	11	26.83
Very Large	<u>6</u>	13.04	<u>8</u>	15.09	<u>1</u>	2.44
	46		53		41	
11. Glabella:						
Small	1	2.27	5	9.43	5	12.20
Medium	17	38.64	22	41.51	29	70.73
Large	22	50.00	19	35.85	7	17.07
Very Large	<u>4</u>	9.09	<u>7</u>	13.21	<u>0</u>	0
	44		53		41	
12. Frontal Height:						
Very Low	0	0	0	0	0	0
Low	10	22.22	20	38.46	23	56.10
Medium	30	66.67	26	50.00	16	39.02
High	5	11.11	6	11.54	2	4.88
Very High	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	45		52		41	
13. Frontal Slope:						
None, Bulging	1	2.22	0	0	0	0
Slight	18	40.00	16	30.77	5	12.20
Medium	26	57.78	24	46.15	18	43.90
Pronounced	0	0	12	23.08	18	43.90
Very Pronounced	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	45		52		41	

Table 6 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
14. Metopism:						
Absent	43	100.00	53	100.00	40	97.56
Traces	0	0	0	0	1	2.44
Complete	0	0	0	0	0	0
	<u>43</u>		<u>53</u>		<u>41</u>	
15. Postorbital Constriction:						
Small	3	6.98	0	0	0	0
Medium	10	23.26	9	17.31	10	24.39
Large	30	69.77	43	82.69	31	75.61
	<u>43</u>		<u>52</u>		<u>41</u>	
16. Frontal Bosses:						
Small	22	48.89	28	54.90	27	65.85
Medium	21	46.67	23	45.10	12	29.27
Large	2	4.44	0	0	2	4.88
	<u>45</u>		<u>51</u>		<u>41</u>	
17. Median Crest:						
Small	37	82.22	31	62.00	35	85.37
Medium	7	15.56	19	38.00	6	14.63
Large	1	2.22	0	0	0	0
	<u>45</u>		<u>50</u>		<u>41</u>	
18. Sagittal Elevation:						
Small	35	77.78	28	53.85	33	80.49
Medium	9	20.00	22	42.31	6	14.63
Large	1	2.22	2	3.85	2	4.88
Very Large	0	0	0	0	0	0
	<u>45</u>		<u>50</u>		<u>41</u>	
19. Postcoronal Depression:						
Small	37	82.22	38	71.70	34	82.93
Medium	8	17.78	15	28.30	7	17.07
Large	0	0	0	0	0	0
	<u>45</u>		<u>53</u>		<u>41</u>	
20. Parietal Bosses:						
Small	3	6.67	5	9.43	22	53.66
Medium	38	84.44	34	64.15	19	46.34
Large	4	8.89	14	26.42	0	0
	<u>45</u>		<u>53</u>		<u>41</u>	
21. Parietal Foramina:						
None	17	45.95	24	46.16	19	46.34
Small	15	40.54	17	32.69	22	53.66
Medium	5	13.51	11	21.15	0	0
Large	0	0	0	0	0	0
	<u>37</u>		<u>52</u>		<u>41</u>	

Table 6 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
22. Temporal Fullness:						
Flat	0	0	0	0	0	0
Small	4	8.89	4	7.55	0	0
Medium	23	51.11	27	50.94	14	14.15
Large	<u>18</u>	40.00	<u>22</u>	41.51	<u>27</u>	65.85
	45		53		41	
23. Temporal Crests:						
Low	6	13.64	5	9.43	7	17.07
Medium	21	47.73	34	64.15	31	75.61
High	<u>17</u>	38.64	<u>14</u>	26.42	<u>3</u>	7.32
	44		53		41	
24. Supramastoid Crests:						
Small	3	6.52	11	20.75	4	9.76
Medium	21	45.65	23	43.40	21	51.22
Large	<u>22</u>	47.83	<u>19</u>	35.85	<u>16</u>	39.02
	46		53		41	
25. Sphenoid Depression:						
Medium	3	10.71	10	18.87	5	13.16
Large	<u>25</u>	89.29	<u>43</u>	81.13	<u>33</u>	86.84
	28		53		38	
26. Occipital Curve:						
None	0	0	0	0	0	0
Small	4	8.89	13	24.53	11	26.83
Medium	35	77.78	34	64.15	22	53.66
Pronounced	<u>6</u>	13.33	<u>6</u>	11.32	<u>8</u>	19.51
	45		53		41	
27. Inion:						
None	5	10.87	19	35.85	6	14.63
Small	17	36.96	19	35.85	13	31.71
Medium	12	26.09	8	15.09	15	36.59
Large	<u>12</u>	26.09	<u>7</u>	13.21	<u>7</u>	17.07
	46		53		41	
28. Torus:						
Absent	0	0	0	0	0	0
Small	12	26.09	20	37.74	22	53.66
Medium	20	43.48	27	50.94	16	39.02
Large	<u>14</u>	30.43	<u>6</u>	11.32	<u>3</u>	7.32
	46		53		41	
29. Shape of Torus:						
Ridge	10	21.74	16	30.00	9	21.95
Mound	<u>36</u>	78.26	<u>37</u>	70.00	<u>32</u>	78.05
	46		53		41	

Table 6 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
30. Lambdoid Flattening						
None	11	24.44	9	16.98	4	9.76
Small	18	40.00	25	47.17	11	26.83
Medium	16	35.56	17	32.08	20	48.78
Pronounced	<u>0</u>	0	<u>2</u>	3.77	<u>6</u>	14.63
	45		53		41	
31. Transverse Suture:						
Absent	44	97.78	49	92.45	33	80.49
Present	<u>1</u>	2.22	<u>4</u>	7.55	<u>8</u>	19.51
	45		53		41	
32. Lambdoid Wormian Bones:						
None	27	72.97	42	80.77	30	73.17
Few	10	27.03	6	11.54	10	24.39
Medium	0	0	4	7.69	1	2.44
Many	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	37		52		41	
33. Other Wormian Bones:						
Absent	36	100.00	43	84.31	37	90.24
Coronal	0	0	1	1.96	0	0
Sagittal	0	0	0	0	0	0
Temporo-occipital	0	0	7	13.73	4	9.76
Other	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	36		51		41	
34. Glenoid Fossa Depth:						
Small	15	33.33	15	28.30	18	43.90
Medium	23	51.11	26	49.06	16	39.02
Large	<u>7</u>	15.56	<u>12</u>	22.64	<u>7</u>	17.07
	45		53		41	
35. Postglenoid Process:						
Small	7	15.56	22	41.51	23	56.10
Medium	20	44.44	19	35.85	14	34.14
Large	<u>18</u>	40.00	<u>12</u>	22.64	<u>4</u>	9.76
	45		53		41	
36. Tympanic Plate:						
Thin	2	4.55	7	13.21	3	7.32
Medium	11	25.00	21	39.62	10	24.39
Thick	19	43.18	19	35.85	25	60.97
Very Thick	<u>12</u>	27.27	<u>6</u>	11.32	<u>3</u>	7.32
	44		53		41	

Table 6 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
<b>37. Auditory Meatus:</b>						
Round	2	4.55	2	3.85	1	2.44
Oval	30	60.18	27	51.92	33	80.49
Ellipse	9	20.45	17	32.69	6	14.63
Slit	<u>3</u>	6.82	<u>6</u>	11.54	<u>1</u>	2.44
	44		52		41	
<b>38. Orbits Shape:</b>						
Oblong	4	12.50	4	7.84	1	2.63
Rhomboid	12	37.50	19	37.25	19	50.00
Square	16	50.00	28	54.90	18	47.37
Ellipse	0	0	0	0	0	0
Round	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	32		51		38	
<b>39. Orbits Inclination:</b>						
None	0	0	0	0	0	0
Small	15	46.88	19	35.85	10	26.32
Medium	17	53.13	30	56.60	24	63.16
Pronounced	<u>0</u>	0	<u>4</u>	7.55	<u>4</u>	10.53
	32		53		38	
<b>40. Suborbital Fossa:</b>						
Absent	2	5.13	5	9.43	0	0
Slight	13	33.33	25	47.17	22	56.41
Medium	19	48.72	19	35.85	15	38.46
Deep	<u>2</u>	5.13	<u>4</u>	7.55	<u>2</u>	5.13
	39		53		39	
<b>41. Malar Size:</b>						
Small	0	0	0	0	1	2.50
Medium	5	12.20	6	11.32	13	32.50
Large	21	51.22	34	64.15	23	67.50
Very Large	<u>15</u>	36.59	<u>13</u>	24.53	<u>3</u>	7.50
	41		53		40	
<b>42. Malar Lateral Projection:</b>						
Small	0	0	0	0	1	2.50
Medium	6	17.65	2	3.92	10	25.00
Large	<u>28</u>	82.35	<u>49</u>	96.08	<u>29</u>	72.50
	34		51		40	
<b>43. Malar Anterior Projection:</b>						
Small	1	2.94	0	0	1	2.50
Medium	9	26.47	14	26.42	12	30.00
Large	<u>24</u>	70.59	<u>39</u>	73.58	<u>27</u>	67.50
	34		53		40	

Table 6 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
44. Malar Marginal Process:						
Absent	7	17.50	14	26.42	3	7.50
Submedium	16	40.00	27	50.94	28	70.00
Medium	16	40.00	10	18.87	9	22.50
Large	<u>1</u>	2.50	<u>2</u>	3.77	<u>0</u>	0
	40		53		40	
45. Zygomatic Process Thickness:						
Small	0	0	0	0	0	0
Medium	10	36.63	21	42.00	23	58.97
Pronounced	<u>17</u>	63.37	<u>29</u>	58.00	<u>16</u>	41.03
	27		50		39	
46. Nasion Depression:						
Absent	0	0	0	0	1	2.44
Small	15	34.88	27	50.94	24	58.54
Medium	23	53.49	24	45.28	15	36.59
Deep	<u>5</u>	11.63	<u>2</u>	3.77	<u>1</u>	2.44
	43		53		41	
47. Nasal Root Height:						
Very Low	3	10.34	4	7.84	4	10.53
Low	15	51.72	24	47.06	19	50.00
Medium	9	31.03	19	37.25	15	39.47
High	2	6.90	4	7.84	0	0
Very High	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	29		51		38	
48. Nasal Root Breadth:						
Very Small	2	6.90	5	9.80	0	0
Small	16	55.17	13	25.49	7	18.42
Medium	10	34.48	19	37.25	24	63.16
Large	1	3.45	12	23.53	7	18.42
Very Large	<u>0</u>	0	<u>2</u>	3.92	<u>0</u>	0
	29		51		38	
49. Nasal Bridge Height:						
Very Low	2	8.33	3	7.14	1	2.94
Medium	16	66.67	21	50.00	28	82.35
High	5	20.83	18	42.86	5	14.71
Very High	<u>1</u>	4.17	<u>0</u>	0	<u>0</u>	0
	24		42		34	
50. Nasal Bridge Breadth:						
Small	5	21.74	10	25.00	4	11.11
Medium	13	56.52	21	52.50	29	80.56
Large	<u>5</u>	21.74	<u>9</u>	22.50	<u>3</u>	8.33
	23		40		36	

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
51. Nasal Profile:						
Straight	0	0	0	0	0	0
Concave	25	86.21	38	76.00	37	97.37
Concavo-Convex	4	13.79	12	24.00	1	2.63
Convex	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	29		50		38	
52. Nasal Sills:						
Absent	9	21.43	6	12.00	4	9.76
Dull	18	42.86	16	32.00	13	31.71
Medium	11	26.19	12	24.00	15	36.59
Sharp	<u>4</u>	<u>9.52</u>	<u>16</u>	<u>32.00</u>	<u>9</u>	<u>21.95</u>
	42		50		41	
53. Nasal Spine:						
Absent	0	0	2	4.17	0	0
Small	16	51.61	36	75.00	25	64.10
Medium	11	35.48	6	12.50	10	25.64
Large	<u>4</u>	<u>12.90</u>	<u>4</u>	<u>8.33</u>	<u>4</u>	<u>10.26</u>
	31		48		39	
54. Subnasal Grooves:						
Absent	14	32.56	24	47.06	7	17.07
Small	20	46.51	15	29.41	27	65.85
Medium	8	18.60	11	21.57	6	14.63
Pronounced	<u>1</u>	<u>2.33</u>	<u>1</u>	<u>1.96</u>	<u>1</u>	<u>2.44</u>
	43		51		41	
55. Alveolar Prognathism:						
Absent	0	0	1	2.00	0	0
Slight	23	62.16	22	44.00	12	29.27
Medium	13	35.14	26	52.00	23	26.10
Pronounced	<u>1</u>	<u>2.70</u>	<u>1</u>	<u>2</u>	<u>6</u>	<u>14.63</u>
	37		50		41	
56. Alveolar Border Absorption:						
None	16	47.06	11	20.75	21	51.22
Slight	4	11.76	21	39.62	11	26.83
Medium	10	29.41	14	26.42	8	19.51
Pronounced	<u>4</u>	<u>11.76</u>	<u>7</u>	<u>13.21</u>	<u>1</u>	<u>2.44</u>
	34		53		41	
57. Palate Shape:						
Parabolic	15	37.50	13	27.08	13	32.50
Hyperbolic	23	57.50	31	64.58	27	67.50
Elliptical	2	5.00	3	6.25	0	0
Small U	0	0	1	2.08	0	0
Large U	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	40		48		40	



	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
58. Palate Height:						
Low	0	0	1	2.00	5	12.20
Medium	12	30.77	25	50.00	26	63.41
High	26	66.67	23	46.00	9	21.95
Very High	<u>1</u>	2.56	<u>1</u>	2.00	<u>1</u>	2.44
	38		50		41	
59. Palatine Torus Form:						
Ridge	26	74.29	34	79.07	32	84.21
Mound	6	17.14	5	11.63	4	10.53
Lump	<u>3</u>	8.57	<u>4</u>	9.30	<u>0</u>	0
	35		43		36	
60. Palatine Torus Size:						
Absent	0	0	7	14.29	1	2.70
Small	26	74.29	37	75.71	16	43.24
Medium	7	20.00	5	10.20	20	54.05
Large	<u>2</u>	5.71	<u>0</u>	0	<u>0</u>	0
	35		49		37	
61. Postnasal Spine:						
Absent	0	0	6	12.00	1	2.70
Small	14	45.16	28	56.00	16	43.24
Medium	17	54.84	16	32.00	19	51.35
Large	<u>0</u>	0	<u>0</u>	0	<u>1</u>	2.70
	31		50		37	
62. Mandible Size:						
Small	0	0	0	0	0	0
Medium	11	25.00	18	35.29	18	45.00
Large	24	54.55	25	49.02	22	55.00
Very Large	<u>9</u>	20.45	<u>8</u>	15.69	<u>0</u>	0
	44		51		40	
63. Chin Form:						
Median	11	25.00	20	39.22	16	40.00
Bilateral	<u>33</u>	75.00	<u>31</u>	60.78	<u>24</u>	60.00
	44		51		40	
64. Chin Projection:						
Negative	0	0	0	0	0	0
Neutral	7	16.28	14	26.92	2	5.00
Small	21	48.84	29	55.77	26	65.00
Medium	12	27.91	7	13.46	12	30.00
Large	<u>3</u>	6.98	<u>2</u>	3.85	<u>0</u>	0
	43		52		40	

Table 6 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
<b>65. Mandibular Alveolar Prognathism:</b>						
None	14	36.84	10	19.61	2	5.00
Slight	20	52.63	35	68.63	36	90.00
Medium	4	10.53	6	11.76	2	5.00
Pronounced	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	<u>38</u>		<u>51</u>		<u>40</u>	
<b>66. Genial Tubercles:</b>						
Absent	0	0	2	3.85	0	0
Small	10	22.73	35	67.31	22	55.00
Medium	22	50.00	14	26.92	17	42.50
Large	<u>12</u>	27.27	<u>1</u>	1.92	<u>1</u>	2.50
	<u>44</u>		<u>52</u>		<u>40</u>	
<b>67. Mylo-hyoid Ridge:</b>						
Absent	6	13.64	13	25.00	5	12.50
Slight	25	56.82	37	71.15	22	55.00
Medium	12	27.27	2	3.85	12	30.00
Pronounced	<u>1</u>	2.27	<u>0</u>	0	<u>1</u>	2.50
	<u>44</u>		<u>52</u>		<u>40</u>	
<b>68. Pterygoid Attachment:</b>						
Small	3	6.67	2	3.85	6	15.00
Medium	15	33.33	25	48.08	25	62.50
Pronounced	24	53.33	20	38.46	9	22.50
Very Pronounced	<u>3</u>	6.67	<u>5</u>	9.62	<u>0</u>	0
	<u>45</u>		<u>52</u>		<u>40</u>	
<b>69. Gonial Angle Eversion:</b>						
None	2	4.55	6	11.54	5	12.50
Small	17	38.64	23	44.23	25	62.50
Medium	19	43.18	18	34.62	8	20.00
Pronounced	<u>6</u>	13.64	<u>5</u>	9.62	<u>2</u>	5.00
	<u>44</u>		<u>52</u>		<u>40</u>	
<b>70. Tooth Eruption:</b>						
Incomplete	0	0	1	1.92	0	0
Complete	34	82.93	47	90.38	36	90.00
Third Molar Supressed	<u>6</u>	14.63	<u>4</u>	7.69	<u>4</u>	10.00
	<u>40</u>		<u>52</u>		<u>40</u>	
<b>71. Teeth Lost Ante-Mortem:</b>						
0	25	92.50	29	60.42	23	57.50
1-4	1	3.70	12	25.00	16	40.00
5-8	0	0	6	12.50	1	2.50
9-12	0	0	1	2.08	0	0
13-16	1	3.70	0	0	0	0
17-20	0	0	0	0	0	0
21-x	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	<u>27</u>		<u>58</u>		<u>40</u>	

Table 6 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
72. Mandibular Torus:						
Small	29	65.91	45	88.24	39	97.50
Medium	13	29.55	6	11.76	1	2.50
Large	2	4.55	0	0	0	0
	<u>44</u>		<u>51</u>		<u>40</u>	
73. Teeth Wear:						
None	0	0	0	0	0	0
Slight	2	4.35	13	24.53	8	20.00
Medium	13	28.26	20	37.74	15	37.50
Pronounced	21	45.65	16	30.19	15	37.50
Very Pronounced	10	21.74	4	7.55	2	5.00
	<u>46</u>		<u>53</u>		<u>40</u>	
74. Teeth Caries:						
0	20	74.07	13	39.39	6	16.22
1-4	7	25.93	19	57.58	29	78.38
5-8	0	0	1	3.03	1	2.70
9-16	0	0	0	0	1	2.70
17-x	0	0	0	0	0	0
	<u>27</u>		<u>33</u>		<u>37</u>	
75. Alveolar Abcess:						
0	15	44.12	20	38.46	19	47.50
1-3	15	44.12	18	34.62	15	37.50
4-x	4	11.76	14	26.92	6	15.00
	<u>34</u>		<u>52</u>		<u>40</u>	
76. Abcess Size:						
Small	4	21.05	7	21.88	4	19.05
Medium	12	63.16	23	71.88	12	57.14
Large	3	15.79	2	6.25	5	23.81
	<u>19</u>		<u>32</u>		<u>21</u>	
77. Shovel-shaped Incisors:						
Absent	1	2.50	0	0	0	0
Slight	6	15.00	3	6.98	8	20.00
Medium	1	2.50	13	30.23	10	25.00
Pronounced	0	0	1	2.33	2	5.00
Not Observed	32	80.00	26	60.47	20	50.00
	<u>40</u>		<u>43</u>		<u>40</u>	
78. Bite:						
Under	1	2.50	0	0	0	0
Edge	36	90.00	38	79.17	36	94.74
Slight Over	3	7.50	9	18.75	2	5.26
Medium Over	0	0	1	2.08	0	0
Pronounced Over	0	0	0	0	0	0
	<u>40</u>		<u>48</u>		<u>38</u>	

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
79. Crowding:						
Absent	29	70.73	37	74.00	20	50.00
Slight	9	21.95	11	22.00	17	42.50
Medium	1	2.44	1	2.00	3	7.50
Pronounced	2	4.88	1	2.00	0	0
	<u>41</u>		<u>50</u>		<u>40</u>	

TABULATION OF POST-CRANIAL MORPHOLOGICAL OBSERVATIONS.

<u>FEMUR:</u>	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
1. Crista Hypotrochanterica:						
Absent	0	0	0	0	2	5.13
Submedium	19	41.30	12	34.29	24	61.54
Medium	17	36.96	15	42.86	6	15.38
Pronounced	9	19.57	8	22.86	7	17.95
Very Pronounced	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	46		35		39	
2. Fossa Hypotrochanterica:						
Absent	0	0	0	0	1	2.56
Submedium	20	43.48	11	31.43	22	56.41
Medium	16	34.78	18	51.43	16	41.03
Pronounced	10	21.74	6	17.14	0	0
Very Pronounced	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	46		35		39	
3. Third Trochanter:						
Absent	16	35.56	10	28.57	34	87.18
Submedium	15	33.33	12	34.29	4	10.26
Medium	8	17.78	9	25.71	1	2.56
Pronounced	4	8.89	4	11.43	0	0
Very Pronounced	<u>2</u>	4.44	<u>0</u>	0	<u>0</u>	0
	45		35		39	
4. Mid-Shaft Shape:						
Oval	3	7.32	1	2.78	1	2.56
Plano-convex	1	2.44	0	0	4	10.26
Quadrilateral	3	7.32	3	8.33	1	2.56
Prismatic	20	48.78	17	47.22	33	84.62
Round	<u>14</u>	34.15	<u>15</u>	41.67	<u>0</u>	0
	41		36		39	
5. Linea Aspera:						
Absent	0	0	0	0	0	0
Submedium	6	13.95	4	11.76	19	48.72
Medium	13	30.23	7	20.59	11	28.21
Slight Pilaster	13	30.23	12	35.29	4	10.26
Medium Pilaster	11	25.58	7	20.59	4	10.26
Pronounced Pilaster	<u>0</u>	0	<u>4</u>	11.76	<u>1</u>	2.56
	43		34		39	

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
6. Right Femur Torsion						
Negative	0	0	0	0	0	0
Neutral	0	0	0	0	0	0
Slight	7	18.92	2	7.69	4	11.43
Medium	21	56.76	14	53.85	10	28.57
Pronounced	9	24.32	8	30.77	18	51.43
Very Pronounced	0	0	2	7.69	3	8.57
	<u>37</u>		<u>26</u>		<u>35</u>	
7. Left Femur Torsion:						
Negative	0	0	0	0	0	0
Neutral	0	0	0	0	0	0
Slight	7	19.44	0	0	3	8.11
Medium	18	50.00	21	65.63	9	24.32
Pronounced	11	30.56	11	34.38	21	56.76
Very Pronounced	0	0	0	0	4	10.81
	<u>36</u>		<u>32</u>		<u>37</u>	

TIBIA:

8. Mid-shaft Shape:						
Ordinary Prism	7	16.67	5	14.29	0	0
Lateral Prism	15	35.71	10	28.57	11	28.21
External Surface Concave	3	7.14	0	0	23	58.97
Quadrilateral	7	16.67	17	48.57	4	10.26
Posterior Half Oval	3	7.14	0	0	1	2.56
Plano-convex	5	11.90	3	8.57	0	0
Indefinite	2	4.76	0	0	0	0
	<u>42</u>		<u>35</u>		<u>39</u>	
9. Retroversion of Head:						
Absent	0	0	0	0	0	0
Submedium	10	25.64	11	32.35	5	12.82
Medium	28	71.79	18	52.94	34	87.18
Pronounced	1	2.56	5	14.71	0	0
	<u>39</u>		<u>34</u>		<u>39</u>	
10. Squatting Facets:						
Present	5	13.51	6	17.65	6	15.38
Absent	32	86.49	28	82.35	33	84.62
	<u>37</u>		<u>34</u>		<u>39</u>	

FIBULA:

11. Fluting of Shaft:						
Absent	0	0	0	0	1	2.63
Submedium	9	24.32	12	37.50	25	65.79
Medium	27	72.97	14	43.75	12	31.58
Pronounced	1	2.70	6	18.75	0	0
	<u>37</u>		<u>32</u>		<u>38</u>	

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
12. Shaft Shape:						
Oblong	0	0	0	0	0	0
Plano-convex	19	44.19	6	17.14	11	28.21
Prismatic	6	13.95	27	77.14	9	23.08
Irregular	4	9.30	0	0	0	0
Trapezoid	14	32.56	2	5.71	19	48.72
Oval	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	43		35		39	
13. Perforation of Olecranon Fossa:						
Absent	36	75.00	20	58.82	24	61.54
Present	<u>12</u>	25.00	<u>14</u>	41.18	<u>15</u>	38.46
	48		34		39	
14. Supracondyloid Process:						
Absent	40	93.02	24	96.00	38	97.44
Traces	3	6.98	1	4.00	0	0
Present	<u>0</u>	0	<u>0</u>	0	<u>1</u>	2.56
	43		25		39	
<u>PELVIS:</u>						
15. Depth of Ischiatic Notch:						
Small	3	8.33	0	0	3	7.69
Medium	14	38.89	13	48.15	30	76.92
Deep	<u>19</u>	52.78	<u>14</u>	51.85	<u>6</u>	15.38
	36		27		39	
16. Width of Ischiatic Notch:						
Small	15	41.67	15	57.69	7	17.95
Medium	20	55.56	10	38.46	25	64.10
Wide	<u>1</u>	2.78	<u>1</u>	3.85	<u>7</u>	17.95
	36		26		39	
17. Depth of Preauricular Sulcus:						
Small	30	76.92	23	85.19	36	92.31
Medium	9	23.08	4	14.81	3	7.69
Deep	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	39		27		39	
18. Width of Preauricular Sulcus:						
Small	26	66.67	21	77.78	33	84.62
Medium	13	33.33	6	22.22	6	15.38
Wide	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	39		27		39	

Table 7 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
19. Sub-pubic Angle:						
Small	10	52.63	15	65.22	9	31.03
Medium	9	47.37	8	34.78	20	68.97
Large	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	19		23		29	
20. Ischia:						
Parallel	4	16.67	3	15.79	4	12.12
Converging	19	79.17	15	78.95	26	78.79
Diverging	<u>1</u>	4.17	<u>1</u>	5.26	<u>3</u>	9.09
	24		19		33	
21. Age by Pubic Symphysis:						
I (18-19)	0	0	0	0	0	0
II (20-21)	0	0	0	0	0	0
III (22-24)	1	4.17	3	13.04	0	0
IV (25-26)	2	8.33	4	17.39	2	6.45
V (27-30)	7	29.17	3	13.04	10	32.26
VI (30-35)	3	12.50	4	17.39	4	12.90
VII (35-39)	7	29.17	3	13.04	9	29.03
VIII (39-44)	3	12.50	5	21.74	6	19.35
IX (45-50)	0	0	1	4.35	0	0
X (50-x)	<u>1</u>	4.17	<u>0</u>	0	<u>0</u>	0
	24		23		31	
<u>SCAPULA:</u>						
22. Superior Border:						
Oblique	1	7.69	10	66.67	5	18.52
Wavy	0	0	0	0	0	0
Concave	<u>12</u>	92.31	<u>5</u>	33.33	<u>23</u>	85.19
	13		15		27	
23. Scapular Notch:						
Absent	2	10.00	2	8.00	3	8.57
Submedium	2	10.00	3	12.00	14	40.00
Medium	8	40.00	7	28.00	10	28.57
Deep	8	40.00	13	52.00	6	17.14
Foramen	<u>0</u>	0	<u>0</u>	0	<u>2</u>	5.71
	20		25		35	
24. Vertebral Border:						
Convex	3	37.50	6	54.55	18	69.23
Straight	4	50.00	5	45.45	8	30.77
	<u>1</u>	12.50	<u>0</u>	0	<u>0</u>	0
	8		11		26	

Table 7 cont'd.



	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
25. Acromion Process Shape:						
Sickle	2	9.09	1	4.00	0	0
Triangular	13	59.09	16	64.00	22	68.75
Intermediate	3	13.64	6	24.00	1	3.13
Quadrangular	<u>4</u>	<u>18.18</u>	<u>2</u>	<u>8.00</u>	<u>9</u>	<u>28.13</u>
	22		25		32	
26. Clavicular Facet:						
Unlipped	13	59.09	7	25.93	9	27.27
Lipped	<u>9</u>	<u>40.91</u>	<u>20</u>	<u>74.07</u>	<u>24</u>	<u>72.73</u>
	22		27		33	
27. Age Plaque:						
Absent	0	0	10	35.71	19	51.35
Slight	6	66.67	3	10.71	14	37.84
Medium	2	22.22	4	14.29	4	10.81
Pronounced	<u>1</u>	<u>11.11</u>	<u>1</u>	<u>3.57</u>	<u>0</u>	<u>0</u>
	9		28		37	
28. Glenoid Shape:						
Oval	1	3.33	1	3.23	4	10.53
Elliptical	9	30.00	13	41.94	2	5.26
Periform	<u>20</u>	<u>66.67</u>	<u>17</u>	<u>54.84</u>	<u>32</u>	<u>84.21</u>
	30		31		38	
29. Lipping of Glenoid Fossa:						
Absent	7	25.93	6	20.69	18	47.37
Submedium	8	29.63	14	48.28	17	44.74
Medium	10	37.04	6	20.69	2	5.26
Pronounced	<u>2</u>	<u>7.41</u>	<u>3</u>	<u>10.34</u>	<u>1</u>	<u>2.63</u>
	27		29		38	
30. Pleating or Buckling:						
Absent	1	14.29	6	54.55	24	82.76
Submedium	2	28.57	5	45.45	3	10.34
Medium	3	42.86	0	0	2	6.90
Pronounced	<u>1</u>	<u>14.29</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	7		11		29	
31. Atrophic Patches:						
Absent	3	60.00	8	72.73	22	75.86
Submedium	0	0	2	18.18	7	24.14
Medium	1	20.00	0	0	0	0
Pronounced	<u>1</u>	<u>20.00</u>	<u>1</u>	<u>9.09</u>	<u>0</u>	<u>0</u>
	5		11		29	

Table 7 cont'd.

	<u>Early</u>		<u>Middle</u>		<u>Late</u>	
	No.	Percent	No.	Percent	No.	Percent
<b><u>SACRUM:</u></b>						
32. Number of Segments:						
Four	0	0	0	0	2	6.25
Five	15	78.95	18	81.82	24	75.00
Six (5th lumbar)	0	0	0	0	2	6.25
Six (1st coccyx)	<u>4</u>	21.05	<u>4</u>	18.18	<u>4</u>	12.50
	19		22		32	
33. Sacral Curve:						
Slight	12	57.14	12	54.55	13	39.39
Medium	7	33.33	7	31.82	17	51.52
Pronounced	<u>2</u>	9.52	<u>3</u>	13.64	<u>3</u>	9.09
	21		22		33	
34. Curve Begins:						
Four	19	86.36	19	90.48	23	67.65
Three	3	13.64	1	4.76	11	32.35
Two	0	0	1	4.76	0	0
One	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	22		21		34	
35. Sacral Type:						
Homobasal	1	3.70	3	13.04	3	8.82
Hypobasal	24	88.89	19	82.61	30	88.24
Hyperbasal	<u>2</u>	7.41	<u>1</u>	4.35	<u>1</u>	2.94
	27		23		34	
<b><u>STERNUM:</u></b>						
36. Fusion:						
None	12	70.59	21	87.50	28	80.00
Corpus	5	29.41	3	12.50	7	20.00
Complete	<u>0</u>	0	<u>0</u>	0	<u>0</u>	0
	17		24		35	
37. Foramen:						
Absent	13	81.25	18	81.82	28	84.85
Present	<u>3</u>	18.75	<u>4</u>	18.17	<u>5</u>	15.15
	16		22		33	

Table 7 cont'd.

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**Explanation of Plates**  
(All numbers are UCMA Catalog numbers)

Plate 1:

- A-D. The Long-Faced Morphological Type  
(A-B: 12-7294, SJo-56, Early Horizon  
(C-D: 12-5707, Sac-66, Middle Horizon
- E-H. The Large Broad-Faced Morphological Type  
(E-F: 12-7604, SJo-68, Early Horizon  
(G-H: 12-6104, CCo-138, Late Horizon
- I-L. The Small Short-Faced Morphological Type  
(I-J: 12-5486, Col-1, Late Horizon  
(K-L: 12-6691, Sac-43, Middle Horizon

Plate 2:

- A-D. The Round-Vaulted Morphological Type  
(A-B: 12-5479, Col-1, Late Horizon  
(C-D: 12-7270, Sac-60, Late Horizon
- E-F. The Narrow Jawed Morphological Type  
12-5939, CCo-138, Late Horizon
- G-H. The Facially Intermediate Morphological Type  
12-7646, SJo-68, Early Horizon
- I-K. Individuals with Great Facial Similarity  
l. to r.: 12-7621, -7604, -7601, SJo-68, Early Horizon
- L-M. An Individual of Great Size and Coarseness  
12-5699, Sac-66, Middle Horizon

Plate 3:

- A-B. An Individual with Extreme Nasal and Mandibular Prominence  
12-7589, SJo-68, Early Horizon
- C-D. An Individual with Pronounced Alveolar Prognathism  
12-7614, SJo-68, Early Horizon
- E-H. Extremes in Size in the Horizon Series  
E-F: 12-6659, Sac-99, Middle Horizon  
G-H: 12-7640, SJo-68, Early Horizon

Plate 3 (cont'd.):

- I-K. Range of Head Form
  - I: 12-6021, CCo-138, Late Horizon
  - J: 12-7582, SJo-68, Early Horizon
  - K: 12-7058, SJo-56, Early Horizon
  
- L. Periosteal Lesions of Long Bones - Right Tibia
  - 12-6274, CCo-138, Late Horizon (1/2 size)



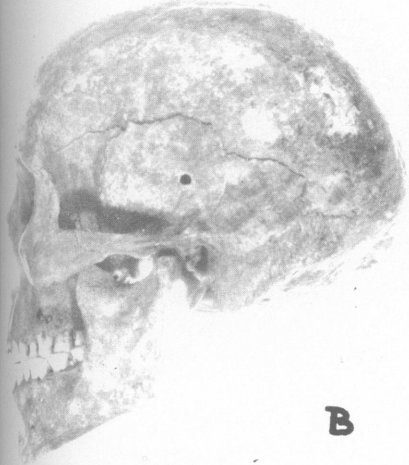
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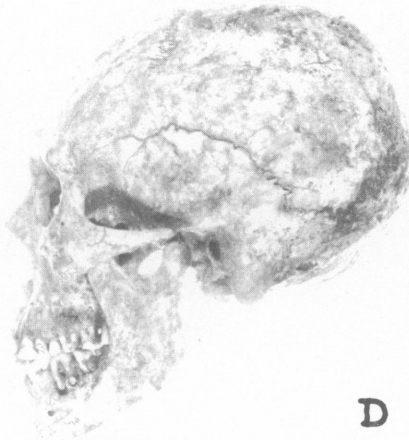
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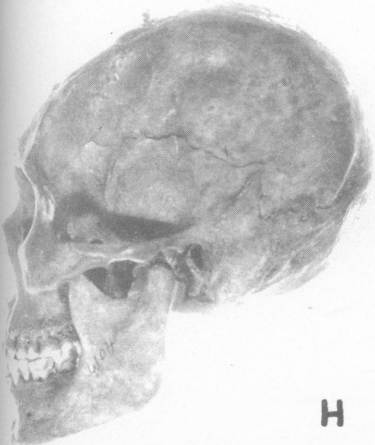
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H

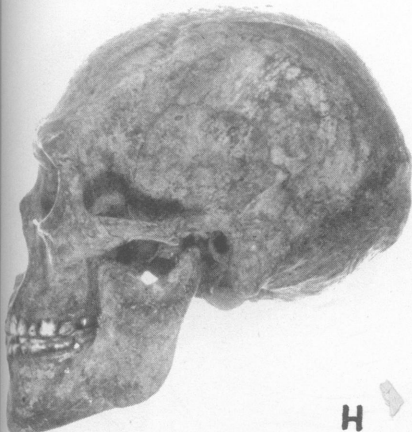
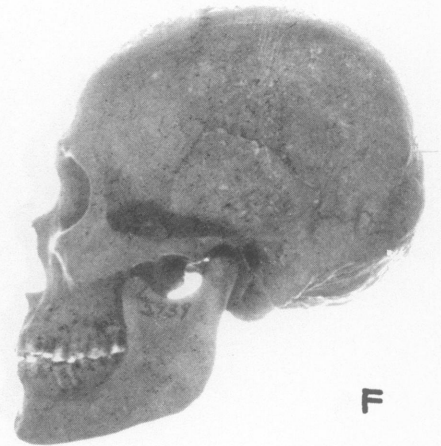
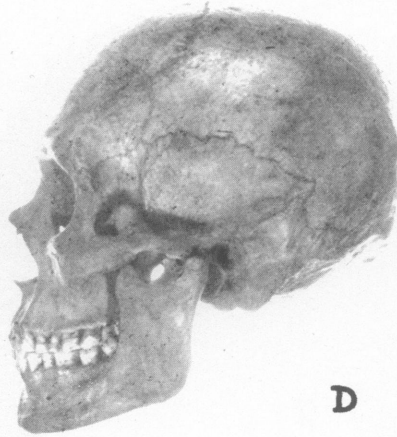
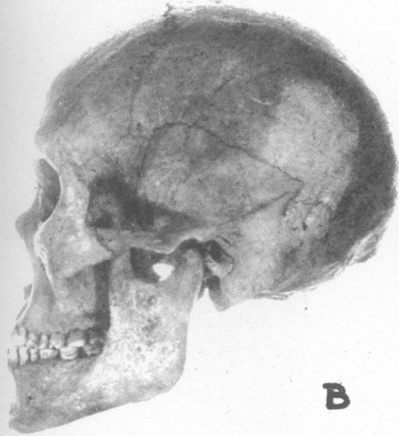


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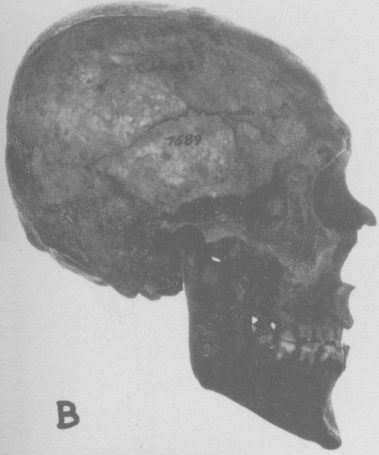
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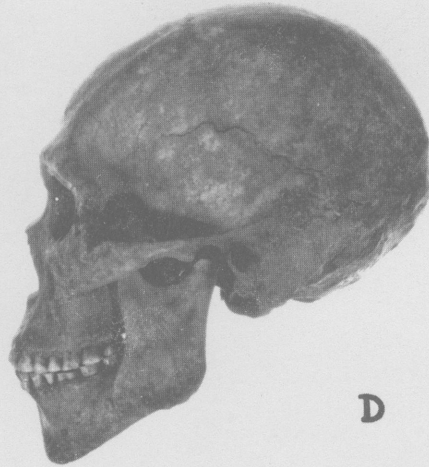
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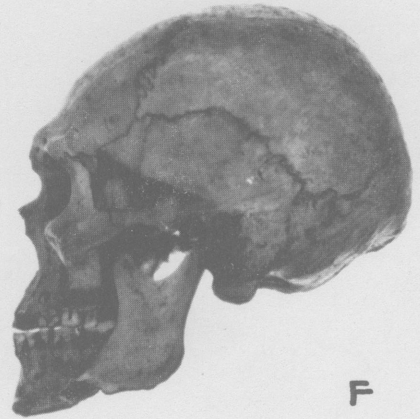
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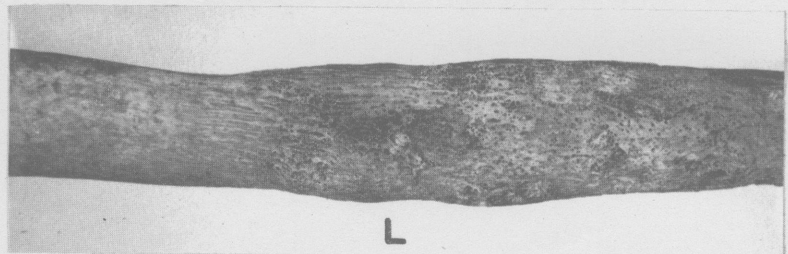
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