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A STUDY OF THE HUMAN SKELETONS FROM KÜLTEPE, EXCAVATED UNDER THE AUSPICES OF THE TURKISH HISTORICAL SOCIETY

THE SKELETONS FROM THE EXCAVATION SEASON OF 1948 [1]

MUZAFFER SÜLEYMAN ŞENYÜREK, Ph. D.

Professor of Anthropology and Chairman of the Division of Palaeoanthropology, University of Ankara

Dr. Tahsin Özgüç, who has been conducting excavations at Kültepe, a site near Kayseri in Central Anatolia, has found a large number of human skeletons in the excavation seasons of 1948, 1949 and 1950, and has brought them to me. I have already finished the study of the skeletons from the excavation season of 1948 and the results obtained are given in this paper. The skeletons from the seasons of 1949 and 1950 will be published separately when my studies on them are completed.

The burial customs and the conditions under which the skeletons were found have already been described by Dr. Özgüç in the excavation report for 1948 [2]. The human skeletons from the excavation season

[1] This paper has been prepared for the Fourth International Congress of Antropological and Ethnological Sciences to be held in Vienna in September 1-8, 1952.

[2] Özgüç, T. : Türk Kurumu tarafından yapılan Kültepe kazısı raporu, 1948 (Ausgrabungen in Kültepe. Bericht über die im Auftrage der Türkischen Historisch-

of 1948 at Kültepe (*Karum Kaniş*), which was an Assyrian trading colony at the beginning of the second millenium B. C. [3] and where a large number of tablets have been found, came from the houses, the names of the heads of which are known, viz., Adad— Sululi, Laqipum and Uzua [4]. These human skeletons from Kültepe are, thus, of further interest in that we know the names of the heads of the households to which they belong.

The skeletons brought to me are listed below, together with the houses and building levels [5] to which they appertain and the present condition of the bones :

Number of Skeleton	Building Level	House of	Condition of the Skeleton
7	III	Adad-Sululi	Cranial fragments that could not be restored and fragmentary post-cranial bones.
9	III	Adad-Sululi	Calva and fragmentary post-cranial bones.
10	III	Adad-Sululi	Defective calva and mostly fragmentary post-cranial bones (left femur relatively better preserved, so that maximum length could be measured).
11	III	Adad-Sululi	Calva and fragmentary post-cranial bones.
12	III	Adad-Sululi	Left half of a calva and fragmentary post-cranial bones.

en Gesellschaft, 1948. Durchgeführten Ausgrabungen). Ankara, 1950, pp. 51-59 and 160-169.

[3] For the chronology of Kültepe see : Bilgiç, E. : Anadolu'nun ilk tarihi çağının ana hatlarile rekonstrüksiyonu. Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Dergisi (Revue de la Faculté de Langue, d'Histoire et de Géographie, Université d'Ankara), vol. VI, No. 5, 1948, pp. 496-500; Özgüç, T. : op. cit., 1950, pp. 94-103 and 210-221.

[4] See Landsberger, B. : Kültepe kazısı hakkında Prof. Landsberger'in raporu. Belleten, vol. XII, No. 48, 1948, pp. 855-859; Özgüç, T. : op. cit.

[5] Information on the houses and building levels to which the skeletons belong has been supplied to me by Dr. Özgüç. Also see Özgüç, T. : op. cit., pp. 51-59 and 160-169.

Number of Skeleton	Building Level	House of	Condition of the Skeleton
13	III	Adad-Sululi	Well-preserved calva and post-cranial bones (left tibia and right and left femora relatively well-preserved so that maximum lengths could be measured).
14	III	Adad-Sululi	Calva and fragmentary post-cranial bones.
15	III	Adad-Sululi	Cranial fragments that could not be measured and broken post-cranial bones.
2A and 2B	II	Uzua	2A : Calva and fragmentary post-cranial bones. 2B [6] : Cranial fragments and mostly fragmentary post-cranial bones (right tibia relatively better preserved so that maximum length could be measured).
4	II	Uzua	Part of a calva and mostly fragmentary post-cranial bones (right and left femora relatively well-preserved so that maximum lengths could be measured).
6a and 6b	II	Laqipum	6a : Cranium and mostly broken post-cranial bones (left femur and part of right femur are preserved). 6b : Only fragmentary post-cranial bones.

It will be seen that the human skeletons belong to building Levels II and III of the four building levels unearthed at Kültepe [7], of which Level IV is the oldest and Level I is the youngest. According

[6] Some bones of this individual are labelled as No. K. 21 and other bones which, undoubtedly, belong to the same individual are marked as No. 2a. But Dr. Özgüç has kindly informed me that bones marked as K.21 belong to individual 2 B. Thus, other bones of the same individual marked as 2a, which are different from other bones designated as 2A, also belong to individual 2B.

[7] See Özgüç, T. : op .cit., pp. 15 and 119.

to Dr. Özgüç [8] three skeletons, of which two are badly preserved and one is that of a newborn, were found in Level I, but these have not been brought to me for study. So that for this study we have only the skeletons from the building Level II and the older building Level III.

During the course of this study, I observed that incorporated with some of the skeletons enumerated before are the remains of additional individuals. Such cases are listed below :

Number of Skeleton	Remains of additional individuals
10 (House of Adad-Sululi)	Femora and tibiae of two individuals
11 (House of Adad-Sululi)	Fragments of three humeri belonging to two individuals.
12 (House of Adad-Sululi)	Fragments of three mandibulae belonging to three individuals.
13 (House of Adad-Sululi)	Fragmentary bones of a second and younger individual.
2A and 2B (House of Uzua)	Fragments of three mandibulae belonging to three individuals. In addition, a couple of cranial bones belonging perhaps to a fourth individual.
4 (House of Uzua)	Pieces of two mandibulae and fragments of three femora belonging to two adults. In addition, cranial bones of a child.

Dr. Özgüç states : "*Zum ersten Male in Anatolien wurden hier Belege erhalten, wonach die Toten auch verbrannt waren.*" [9] By this he refers to skeletons 6a and 6b found again in a box grave [10]. During the course of this study I observed that bones of three more individuals (Nos. 7, 9 and 14, all from the House of Adad-Sululi) show signs of having been exposed to fire.

[8] Ibid., p. 51 and p. 160.
[9] Ibid., p. 166.
[10] Ibid., pp. 53-54 and 163-164.

Among the material brought to me, with the bones of human skeletons Nos. 7, 12, 13, 6a and 6b are mixed some animal bones. These probably belong to sacrificed animals buried with the dead of Karum Kaniş.

Age and Sex

Of the skeletons from Kültepe, Nos. 9, 11, 12, 2A and 6b are those of adult males. Nos. 10, 13 and 4 [11] are those of adult females, while Nos. 7, 2B and 6a [12] are of the subadult females. Skeletons Nos. 14 and 15 are those of juveniles.

The Skeletons from Kültepe

The measurements of the skulls from Levels III and II in Kültepe are listed in Tables 1 and 2, the whole series, irrespective of level, in Table 3, and the measurements of the mandibles in Table 4 (For the photographs of the crania see Figs. 1 to 14).

Of the skulls listed in these tables, No. 10 is of too fragmentary a nature. In this the breadth has been calculated from the preserved right half of the calva, while the length is a rough estimate as the occipital part of the skull is broken and missing. Of skull No. 12, only the left half of the calva and of the face are preserved (see Figs. 4 and 5). The skull breadth and the bizygomatic diameter are calculated from the preserved left half of these parts, while the length measurements have been taken directly. In skull No. 4 the glabella region and a part of the occiput are broken, but the length measurement taken must be near the actual one. In skull No. 9 the glabella region of os frontale is broken and has been restored with Plaster of Paris, but the measured length cannot be inferior to the actual one.

As can be seen from Tables 1 and 2, the skulls from Kültepe, especially those of the males, are quite large. The male skulls from Level III are dolichocephalic, while the female crania from this level are dolichocephalic and mesocephalic. On the other hand, in

[11] The second individual found with the bones of skeleton No. 4 is also a female, while the remains of the third individual belong to a child.

[12] About 18 years of age.

the younger Level II, the one male skull is mesocephalic, approaching brachycephaly, while one of the females is mesocephalic and the other brachycephalic. Thus it is seen that in passing from Level III to the younger Level II the cranial index tends to increase.

In porion-bregma height-length index the crania of both sexes from Level III are orthocephalic. The male skull from Level II is orthocephalic, while the two female crania from this building level are hypsicephalic. That is, in passing from Level III to the younger Level II porion-bregma height-length index tends to increase. In porion-bregma height-breadth index, the male skull from Level III is tapeinocranic, and the female skull is akrocranic. In Level II, the skull of the male individual and one of the females is tapeinocranic, while the other female is in the metriocranic category. In fronto-parietal index one female skull from Level II is eurymetopic, while another female from Level II is metriometopic.

In the upper facial index, one male from Level III and one female from Level II are both in the mesen category. In orbital index the two male skulls from Level III and one male from Level II are chamaeconchic, while the female from the latter level is hypsiconchic. In the nasal index, one male from Level III is mesorrhine, while a female from Level II is leptorrhine. In one female skull (6a) from Level II, the external palatal index is very high, but this is no doubt at least partly due to the fact that in this subadult individual the wisdom teeth had not yet erupted.

The form of the skull, in norma verticalis, is usually ovoid in the males and pentagonoid and ovoid in the females. The slope of the forehead varies from moderate to pronounced in the males, and from submedium to medium in the females. The size of the brow ridges and of glabella vary from moderate to pronounced in the males and from slight to moderate in the females. The occipital region of the skulls, in norma lateralis, is in most cases well-curved. Some of the skulls show slight or moderate lambdoid flattening, which is rather noticeable in skull No. 6a, but there is no plano-occipital flattening. The male skulls usually possess a torus occipitalis, varying in development from slight to pronounced, while in female crania this torus is slight or non-existent. The nasal bones are preserved in only one skull (No. 12) and show a convex profile (see Fig. 5).

The mandibular index of the female skull from building Level II in Kültepe is very low, [13] showing a relatively short mandible (see table 5). In the average index of the ascending ramus the mandibles from this site exceed the average of recent Europeans (49.1) given by Martin [14]. On the other hand, in the average height-thickness index of the corpus the mandibles from Kültepe are equal to the average of modern French (40.8) given by Martin [15]. The chin projection in the available mandibles varies from submedium to pronounced.

The measurements of femora and tibiae from Kültepe are listed respectively in Tables 5 and 6 and the maximum lengths of other post-cranial bones in Table 7. Most of the femora from Kültepe are platymeric, only two being eurymeric. Index pilastricus is quite variable. In some individuals it is below and in some above 100. Most of the tibiae from this site are eurycnemic and only two are platycnemic.

The statures calculated from the lengths of femora, tibiae, humeri and radii, according to Pearson's formulae [16] are shown in Table 8. The average statures for males and females calculated from various long bones are as follows :

	Female	Male
Femur	(3) 156.26	—
Tibia	(2) 152.03	—
Humerus	(2) 152.23	—
Radius	(1) 153.09	(1) 165.24
Femur and Humerus	(1) 152.07	—

From Table 8 it is seen that only one female (No. 10) is tallish, while the other females and one available male are in the medium stature category accepted for females and males.

As for the racial types represented, the skulls from Kültepe belong to two main types: Eurafrican and Alpine. The Eurafrican

[13] For comparative figures see Martin, R. : Lehrbuch der Anthropologie, vol. II, 1928, Jena, p. 971.

[14] Ibid., p. 983.

[15] Ibid., p. 979.

[16] For Pearson's formulae : Ibid., pp. 1070-1071.

type is represented by the big-headed dolichocephalic skulls from building Level III of this site and the Alpine type is represented by the brachycephalic female from Level II. The mesocephalic crania from Kültepe are probably the result of mixture of these two types.

Other pertinent questions will be discussed after the skulls from Kültepe have been compared with those from Mesopotamia and Anatolian crania from 2000 to 1200 B.C., which is necessary, since Kültepe was the site of an Assyrian trading colony established in central Anatolia at the beginning of the second millenium B. C.

Comparison of the measurements of the Crania from Kültepe with those from Mesopotamia, of Earlier and Later Date

The measurements of the skulls from Kültepe are compared with those from Mesopotamia in Table 9. The Mesopotamian figures have been taken from Tables I, II, III and IV of Ehrich [17] who has compiled the data from Keith [18], Buxton and Rice [19] and Hamy [20], in additions to his own data from Nuzi (Yorgantepe). Of these the skulls from Al-Ubaid and those from Mound A at Kish are earlier in date than the skulls from Kültepe, while those from the "*Tomb Mound*" of Ur roughly correspond in time to the colonial period at Kültepe, that is the time of the skulls from this site. For date of Al-Ubaid and Ur skulls Keith states : *Those of the first group were obtained in the winter of 1923-4 from graves in the ancient cemetery at al-'Ubaid and represent the earliest inhabitants of Mesopotamia that have so far come under the eye*

[17] Ehrich, R. W. : Late cemetery crania. In R. F. S. Starr's : Nuzi I. Report on the excavations at Yorgantepe near Kirkuk. Appendix F. Harvard University Press, Cambridge, Mass., 1939, pp. 570-589.

[18] Keith, Sir A. : Report on the Human Remains. In H. R. Hall and C. L. Woolley : Ur excavations. Vol.I. Al-'Ubaid. Publications of the joint expedition of the British Museum and of the Museum of the University of Pennsylvania to Mesopotomia. Oxford University Press, 1927, pp. 214-240.

[19] Buxton, L. H. D. and Rice, D. T. : Report on the human remains found at Kish. Journal of the Royal Anthropological Institute, vol. LXI, 1931, pp. 57-119.

[20] Hamy, E. T. : Documents pour servir à l'Anthropologie de la Babylonie. Nouvelles Archives du Museum d'Histoire Naturelle, vol. 7, series 2, Paris, 1884 (Cited by Ehrich, 1939).

Skulls from Level III in Kültepe (Skulls from the House of Adad-Sululi) [1]

	Males				Females [2]			Juvenile
	No. 9	No. 11	No. 12	Average	No. 10	No. 13	Average	No. 14
Glabello-occipital length	193.00	192.00	205.00	196.66	177.00??	187.00	182.00	169.00
Maximum width	143.00	138.00?	134.00?	138.30	140.00??	133.00	136.50	135.00
Minimum frontal diameter	—	—	—	—	—	97.00	97.00	—
Porion-bregma height	112.00	—	—	112.00	—	115.00	115.00	110.00
Mean thickness of parietal	5.00	5.60	5.00	5.20	—	6.00	6.00	3.60
Horizontal circumference	—	—	—	—	—	515.00	515.00	—
Transverse arc	—	—	—	—	—	308.00	308.00	—
Bizygomatic diameter	—	—	125.00?	125.00?	—	—	—	—
Nasion-prosthion length	—	—	64.00	64.00	—	—	—	—
Orbit width (Dacryon-ectoconchion)	—	41.00?	39.00	40.00	—	—	—	—
Orbit height	—	31.00?	30.00	30.50	—	—	—	—
Nasal length	—	—	50.00?	50.00?	—	—	—	—
Nasal width	—	—	24.00?	24.00?	—	25.50	25.50	—
Palate-external length	—	—	—	—	—	—	—	—
Palate-external width	—	—	—	—	—	—	—	—
Cranial index	74.09	71.87	65.36	70.44	79.09??	71.12	75.10	79.88
Po-b-length index	58.03	—	—	58.03	—	61.49	61.49	65.08
Po-b-breadth index	78.32	—	—	78.32	—	86.46	86.46	81.48
Fronto-parietal index	—	—	—	—	—	72.93	72.93	—
Upper facial index	—	—	51.20	51.20	—	—	—	—
Cranio-facial index	—	—	93.28	93.28	—	—	—	—
Zygo-frontal index	—	—	—	—	—	—	—	—
Orbital index	—	75.60	76.92	76.26	—	—	—	—
Nasal index	—	—	48.00?	48.00?	—	—	—	—
External palatal index	—	—	—	—	—	—	—	—

[1] Measurements in millimeters.

[2] Only the nasal breadth (23.0? mm.) of Skull No. 7 could be measured.

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TABLE 4

Mandibles from Houses of Adad-Sululi, Uzua and Laqipum in Kültepe
(Levels II and III)

	House of Adad-Sululi								House of Uzua	House of Laqipum		Average (Adult ♂ and ♀)
	No. 11 (♂)	No. 12 (♂) a	No. 12 (♂) b	No. 12 (♂) c	No. 7 (♀)	No. 13 (♀)	No. 15 (Juv.)	No. 14 (Juv.)	No.[1] 2 A	No. 4 (♀)	No. 6a (♀)	
Condylo-symphyseal length	—	—	—	—	—	—	101.00	—	—	—	86.00	86.00
Bicondylar width	—	—	—	—	—	—	—	—	—	—	119.00	119.00
Bigonial width	—	—	—	—	—	—	—	—	—	—	97.00	97.00
Height of ascending ramus (From gonion to highest point of condyle)	—	—	—	61.50	—	—	52.00?	—	—	57.00	52.50	57.00
Height of ascending ramus (projected)	—	—	—	—	—	—	43.00?	—	—	52.00	49.00	50.50
Minimum breadth of ascending ramus	—	—	—	33.50	—	—	31.00	29.00	34.50?	33.50	27.00	32.12
Height of corpus (At foramen mentale)	32.00	32.00	30.00	—	29.50	—	29.00	—	—	31.00	27.50	30.33 [2]
Thickness of corpus (At foramen mentale)	15.00	12.00	12.50	—	11.50	16.00	12.00	11.00	14.50	13.00	10.50	13.12 [3]
Bimental width (Distance between the two foramina mentalia)	—	39.50	—	—	39.50	47.00	—	—	47.00	46.00	44.00	43.83
Symphysis length	—	31.50?	—	—	32.00	—	26.00	—	—	31.00	28.00	30.62
Mean angle mandible	—	—	—	113°?	—	—	129°?	122°?	—	121°	119°	117.66°
Mandibular index	—	—	—	—	—	—	—	—	—	—	72.26	72.26
Breadth index	—	—	—	—	—	—	—	—	—	—	81.51	81.51
Index of ascending ramus	—	—	—	54.47	—	—	59.61	—	—	58.77	51.42	54.88
Height-thickness index of the corpus	46.87	37.50	41.66	—	38.98	—	41.37	—	—	41.93	38.18	40.85

[1] In the mandibular fragment of a subadult individual minimum breadth of ascending ramus is 29.50 mm.

[2] Average of 6 specimens.

[3] Average of 8 specimens.

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TABLE 5

Measurements and Indices of the Femora from Kültepe (Femora from the Houses of Adad-Sululi, Uzua and Laqipum)

	Femora from the House of Adad-Sululi					Femora from the House of Uzua		Femora from the House of Laqipum				Average (Adult ♂ and ♀)
						2 A		No. 4				
	No. 11[1]	No. 7[1] Subad.	No. 10	No. 13[1]	No. 14 (Juv.)	1	2[1]	1[1]	2	6b[1]	6a[1]	
a. Length in natural position	—	—	—	—	—	—	—	406,00	—	—	406.25	406.12
b. Maximum length	—	—	467.00?[2]	—	—	—	—	408.50	—	—	411.25	428.91
c. Greatest diameter of the head	—	41.50	—	45.00	—	—	—	40.00	40.00	44.75	40.75	42.00
d. Antero-posterior diameter of subtrochanteric part of diaphysis	—	—	26.00	26.50	18.00	24.00	22.50	25.50	—	26.50	23.50	24.92
e. Breadth of subtrochanteric part of diaphysis	—	—	29.00	33.50	25.00	33.00	35.00	28.50	—	32.00	29.50	31.50
f. Antero-posterior diameter in the middle of diaphysis	28.50	—	30.00	28.00	18.50	23.00		27.00	25.00	—	21.00	26.07
g. Breadth (lateral) in the middle of diaphysis	27.50	—	26.00	27.50	20.00	27.50		24.75	25.50	—	25.00	26.25
h. Circumference in the middle of diaphysis	—	—	88.00	80.00	—	—	—	80.00	80.00	—	72.00	81.60
Index platymericus $\left(\frac{d \times 100}{e}\right)$	—	—	89.65	79.10	72.00	72.72	64.28	89.47	—	82.87	79.66	79.67
Index pilastricus $\left(\frac{f \times 100}{g}\right)$	103.63	—	115.38	101.81	92.50	83.63		109.81	98.03	—	84.00	99.47
Length-thickness index $\left(\frac{h \times 100}{a}\right)$	—	—	—	—	—	—	—	19.70	—	—	17.72	18.71
Robusticity index $\left(\frac{f + g \times 100}{a}\right)$	—	—	—	—	—	—	—	12.74	—	—	11.32	12.03

[1] Averages of two sides.

[2] Maximum length has been obtained by substituting the head of another femur.

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TABLE 9

Comparison of the Measurements of the Skulls from Kültepe with those from Mesopotamia (Mesopotamian Measurements and Indices after Ehrich, 1939)

	Al-Ubaid Beginning of 4 th millenium B. C. (Keith, 1927)		Kish Mound A. 2900-2800 B. C. (Buxton and Rice, 1931)		Ur Tomb Mound 1900-1700 B. C. (Keith, 1927)		Kish Mound W 800-500 B. C. (Buxton and Rice, 1931)	Parthians (Ehrich, 1939, after Hamy)		Nuzi (Yorgantepe) 3rd century A. D. (Ehrich, 1939)		Kültepe (Level III)		Kültepe (Level II)	
	♂	♀	♂	♀	♂	♀	♂	♂	♀	♂	♀	♂	♀	♂	♀
Glabello-occipital length	(6) 192.8	(3) 180.3	(25) 189.5	(3) 178.7	(3) 193.6	(3) 183.0	(4) 191.0	(3) 188.0	(1) 171.0	(11) 190.78	(4) 179.5	(3) 196.66	(2) 182.00	(1) 194.0 +	(2) 177.50
Maximum width	(6) 140.1	(3) 140.0	(25) 137.44	(3) 130.7	(3) 135.0	(3) 132.0	(5) 138.2	(2) 139.5	(1) 136.0	(10) 136.33	(6) 130.4	(3) 138.30	(2) 136.50	(1) 152.00	(2) 144.00
Minimum frontal diameter	(7) 97.0	(2) 91.0	(26) 94.69	(4) 92.3	(3) 97.6	(3) 93.0	(4) 92.25	(3) 94.3	(1) 94.0	(12) 96.45	(4) 93.0	—	(1) 97.00	—	(1) 100.00
Porion-bregma height	(7) 119.6	(4) 112.2	(14) 123.5	(1) 112.0	(3) 116.3	(3) 116.6	(2) 122.5	—	—	(9) 118.28	(7) 110.0	(1) 112.00	(1) 115.00	(1) 111.00	(2) 115.00
Bizygomatic diameter	(5) 127.6	(3) 122.6	(7) 125.3	(1) 110.0	(3) 132.3	(1) 120.0	—	(2) 130.0	(1) 127.0	(3) 129.3	(2) 119.5	(1) 125.00?	—	—	(1) 123.00
Nasion-prosthion length	(5) 72.0	(3) 64.0	(3) 75.33	(1) 62.0	(3) 76.6	(1) 65.0	—	(2) 73.5	—	(8) 74.33	(6) 67.67	(1) 64.00	—	—	(1) 64.50
Orbit width	(3) 40.0	(3) 37.0	(5) 43.4	(1) 37.0	(3) 40.0	(1) 39.0	(2) 41.5	(2) 38.0	(1) 36.0	(7) 38.96	(4) 37.2	(2) 40.00	—	(1) 39.0	(1) 39.00?
Orbit height	(4) 33.6	(3) 31.6	(8) 33.9	(1) 34.4	(3) 36.0	(1) 31.0	—	(2) 36.0	(1) 36.0	(8) 33.25	(5) 33.44	(2) 30.50	—	(1) 32.0	(1) 35.00?
Nasal length	(6) 54.0	(3) 49.0	(2) 54.0	(1) 49.5	(3) 54.6	(1) 46.0	(1) 49.0?	(2) 54.0	(1) 52.0	(8) 53.2	(6) 50.25	(1) 50.00?	—	—	(1) 48.00?
Nasal width	(6) 25.7	(4) 23.4	(1) 24.0	(1) 30.5	(3) 26.6	(4) 24.2	(1) 25.6	(2) 24.3	(1) 23.0	(6) 24.42	(7) 23.0	(1) 24.00?	(1) 25.50	—	(1) 22.00+
Palate-external length	(6) 51.8	—	—	—	—	—	—	(2) 57.5	(1) 56.0	(8) 56.44	(7) 52.6	—	—	—	(1) 41.00
Palate-external width	(6) 64.7	—	—	—	—	—	—	—	—	(7) 62.42	(6) 59.8	—	—	—	(1) 60.50
Cranial index	(6) 72.6	(3) 77.6	(24) 71.54	(3) 73.5	(3) 69.8	(3) 72.2	(4) 72.7	(2) 73.5	(1) 79.5	(10) 71.67	(3) 74.7	(3) 70.44	(2) 75.10	(1) 78.35	(2) 81.11
Po-b-length index	(5) 62.2	(3) 61.9	(13) 65.44	(1) 63.6	(3) 61.1	(3) 63.8	(2) 67.65	—	—	(9) 61.13	(4) 63.0	(1) 58.03	(1) 61.49	(1) 57.21	(2) 64.50
Fronto-parietal index	(7) 68.7	(2) 64.5	(9) 71.22	(3) 71.9	(3) 72.3	(3) 70.7	(4) 66.3	(2) 67.5	(1) 69.12	(9) 71.37	(4) 72.0	—	(1) 72.93	—	(1) 67.34
Upper facial index	(4) 56.3	(3) 52.3	—	(1) 56.4	(3) 58.0	(1) 54.0	—	(2) 56.5	—	(3) 58.0	(1) 56.0	(1) 51.2 ?	—	—	(1) 52.43
Cranio-facial index	(5) 91.4	(3) 87.7	—	—	(3) 98.0	(1) 91.0	—	(1) 90.0	(1) 93.4	(3) 96.7	(2) 97.5	(1) 93.28	—	—	(1) 82.49
Orbital index	(3) 82.5	(3) 86.3	(8)? 81.55	(1) 91.9	(3) 90.0	(1) 79.5	—	(2) 94.7	(1) 100.0	(7) 84.83	(4) 91.7	(2) 76.26	—	(1) 82.05	(1) 89.74
Nasal index	(5) 47.7	(4) 48.9	(2) 44.40	(1) 61.6	(3) 47.8	(1) 52.0	(1) 51.0?	(2) 46.3	(1) 44.2	(6) 46.17	(6) 46.17	(1) 48.00?	—	—	(1) 45.83?
External palatal index	(6) 124.90	—	—	—	—	—	—	—	—	(7) 111.83	(6) 115.0	—	—	—	(1) 147.56

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TABLE 10

Comparison of the Measurements of the Skulls from Kültepe with those from other Sites in Anatolia, dating from 2000 B. C. to 1200 B. C.

	The skulls from Central Anatolian Area (Hittite Area)		The skulls from Chatal Höyük and Tell Al-Judaidah (Calculated from Krogman, 1949) [1]		Tarsus (Skull No. 15) ♀ + (Ehrich, 1940)	Troy VI (Skull No. 13 tr). ♀ + (Angel, 1951)	Kültepe (Level III)		Kültepe (Level II)	
	♂	♀ +	♂	♀ +			♂	♀ +	♂	♀ +
Glabello-occipital length	(14) 181.78	(3) 174.33	(4) 191.50	(4) 171.25	171.00	170.00	(3) 196.66	(2) 182.00	(1) 194.00+	(2) 177.50
Maximum width	(14) 144.71	(3) 141.00	(4) 141.50	(4) 141.62	134.0	150.0	(3) 138.30	(2) 136.50	(1) 152.00	(2) 144.00
Minimum frontal diameter	(12) 98.08	(3) 96.66	(3) 94.33	(4) 95.87	—	—	—	(1) 97.00	—	(1) 100.00
Porion-bregma height	(14) 114.28	(2) 106.00	(4) 114.75	(3) 95.33	115.00?	—	(1) 112.00	(1) 115.00	(1) 111.00	(2) 115.00
Bizygomatic diameter	(11) 131.72	(1) 125.00	—	—	—	135.00	(1) 125.00	—	—	(1) 123.00?
Nasion-prosthion length	(11) 69.09	(1) 62.00	—	—	—	59.00	(1) 64.00	—	—	(1) 64.50?
Orbit width	(12) 40.08	(1) 37.00	—	—	—	40.00?	(2) 40.00	—	(1) 39.00	(1) 39.00?
Orbit height	(12) 32.87	(1) 33.00	—	—	—	30.00	(2) 30.50	—	(1) 32.00	(1) 35.00?
Nasal length	(12) 51.66	(1) 48.00	—	—	—	43.00	(1) 50.00?	—	—	(1) 48.00?
Nasal width	(12) 25.58	(1) 24.00	—	—	—	23.00?	(1) 24.00?	(1) 25.50	—	(1) 22.00+
Palate-external length	(9) 51.44	(1) 43.00	—	—	—	53.00	—	—	—	(1) 41.00+
Palate-external width	(9) 61.66	(1) 64.00	—	—	—	57.00	—	—	—	(1) 60.50
Cranial index	(14) 79.77	(3) 80.88	(4) 73.94	(4) 83.11	78.36	88.23	(3) 70.44	(2) 75.10	(1) 78.35	(2) 81.11
Po-b-length index	(14) 62.96	(2) 61.59	(4) 59.86	(3) 56.31	67.25	—	(1) 58.03	(1) 61.49	(1) 57.21	(2) 64.50
Fronto-parietal index	(12) 67.91	(3) 68.56	(3) 66.61	(4) 67.83	—	—	—	(1) 72.93	—	(1) 67.34
Upper facial index	(11) 52.50	(1) 49.60	—	—	—	43.70	(1) 51.20	—	—	(1) 52.43?
Cranio-facial index	(11) 90.72	(1) 91.24	—	—	—	90.00	(1) 93.28	—	—	(1) 82.49
Orbital index	(12) 82.05	(1) 89.18	—	—	—	75.00	(2) 76.26	—	(1) 82.05	(1) 89.74
Nasal index	(12) 49.76	(1) 50.00	—	—	—	53.48	(1) 48.00?	—	—	(1) 45.83
External palatal index	(9) 120.66	(1) 148.83	—	—	—	107.54	—	—	—	(1) 147.56

[1] The four male skulls (Nos. AS12, BS61, BS64 and BS65 are from Chatal Höyük, while of the four female skulls three (Nos. XS1, XS3 and XS5) come from Tell Al-Judaidah and one (No. BS62) from Chatal Höyük (see Krogman, W. M. : op. cit., 1949).

of the craniologist. The Director of the Joint Expedition, Mr. C. Leonard Woolley, assigns this group to a date about the beginning of the fourth millenium B. C. or earlier. The skulls of the second group of people were obtained during the winter 1925-6 under the 'Tomb Mound' at Ur; they lay in brick-built and other tombs under the floors of the houses. These graves Mr. Woolley assigns to a period dating between 1900 and 1700 B. C." [21] For the skulls from Mound A in Kish, Langdon says : "*All remains from the palace, or in our terminology, mound A, belong to the period immediately preceding the age of Sargon of Agade, and are contemporary with the last (fourth) dynasty of Kish, circa 2900-2800 B. C.*" [22] On the other hand, the skulls from Mound W in Kish, those studied by Hamy and the Nuzi crania are later in date than the skulls from Kültepe. The skulls from Mound W at Kish according to Langdon [23], date from 800-500 B.C., those studied by Hamy from the time of the Parthians [24], and those from Nuzi, according to Ehrich [25], from the 3rd century A. D.

From an examination of Table 9, it is seen that the male and female crania from Level III in Kültepe do not differ much from the Mesopotamian skulls from Al-Ubaid, Kish and Ur in length, breadth and cranial index. If at all, the male crania from Kültepe, on the average, are slightly longer than those from the Mesopotamian sites. In porion-bregma height-length index one male skull from Kültepe has a lower index than the Mesopotamian crania, while the female crania do not differ from the females from Al-Ubaid in this index. In the upper facial index, one male skull from Kültepe has a lower index than the averages of the males from Al-Ubaid, Kish and Ur, which are all lepten. It appears that the skulls from Level III of Kültepe do not differ much from the skulls from Mesopotamia, that is they represent the same population [26].

[21] Keith, Sir A. : op. cit., p. 214.

[22] Langdon, S. : in Buxton and Rice, op. cit., p. 57.

[23] Ibid., p. 58.

[24] Ehrich, R. W. : op. cit., p. 570.

[25] Ibid., p. 570.

[26] As for the cranial types in ancient Mesopotamia, the skulls from Al-Ubaid and "*Tomb Mound*" of Ur studied by Keith (1927), and those from Nuzi studied by Ehrich (1939) are mostly of Eurafrican type. Most of the early skulls from Kish, studied by Buxton and Rice (1931) are longheaded (Eurafrican and Mediterra-

As for the skulls from Level II in Kültepe, the male skull does not differ much from the skulls from Al-Ubaid and Ur in length, but exceeds the averages of all the male Mesopotamian skulls in breadth and cranial index. The female crania from Level II in Kültepe have a shorter length than the skulls of females from Al-Ubaid, Ur and Kish, although those from Mound A at Kish come close to the Kültepe skulls in this measurement. The main difference between the male and female skulls from Level II in Kültepe and those from Mesopotamia is seen in breadth, in which the Kültepe crania far exceed those from Mesopotamia. The maximum breadths of the skulls from Al-Ubaid, Kish, Ur and Nuzi, given by Keith [27], Buxton-Rice [28] and Ehrich, [29] are listed below :

	Males	Females
Al-Ubaid (Keith)	145.00	142.00
Kish, Mound A (Buxton & Rice)	147.00	135.00?
Ur (Keith)	138.00	134.00
Kish, Mound W (Buxton & Rice)	147.00	—
Nuzi (Ehrich)	145.00	138.00
Kültepe (Level II)	152.00	(2) 144.00

Thus it is seen that the male skull from Kültepe (No. 2A, from the House of Uzua) far exceeds the maxima of the Mesopotamian crania in breadth. This skull is probably a mixture of Eurafrican and Alpine types. Similarly the average of the female crania from Kültepe also greatly surpasses the maximum breadths of the female skulls from Mesopotamia [30].

nean types). Among these crania Buxton and Rice (1931) have distinguished a third type which is roundheaded and is clearly in the minority (see Buxton and Rice, 1931, pp. 76-78).

[27] Keith, Sir A. : op. cit., table 1.

[28] Buxton, L. H. D. and Rice, D. T. : op. cit., tables I and II.

[29] Ehrich, R. W. : op. cit., 1939, tables I and II.

[30] One of the female skulls from Kültepe is in the upper ranges of the maxima of the breadths of Mesopotamian crania, while the other greatly surpasses the maxima from Mesopotamia.

In cranial index also the average of the female crania from Level II in Kültepe is much higher than the averages of the females from Al-Ubaid, Kish and Ur. In porion-bregma height-length index, the male skull from Kültepe does not differ from the male skull from Level III and is likewise below the averages of the skulls from Al-Ubaid, Kish and Ur. On the other hand, the female skulls on the average exceed the female skull from Level III in this index and also slightly surpass the averages of the female crania from Mesopotamia. The upper facial index of one female skull from Level II in Kültepe is lower than those of the females from Kish, Ur and Nuzi but does not differ from the average of the female skulls from Al-Ubaid. In nasal index one female skull from Kültepe does not differ much from the one female of Parthian times and from the average of Nuzi females but has a lower index than the females from Al-Ubaid, Kish and Ur.

In short, it appears that the longheaded crania from Level III in Kültepe do not differ much from the Mesopotamian skulls from Al-Ubaid, Kish and Ur and thus probably represent the Assyrian merchants, [31] while those from Level II show a brachycephalic tendency. It is probable that some of the Assyrian merchants of Eurafrican type established at Kültepe had, in the course of history of the trading colony, married Alpine females, the probable identity of which will be discussed below [32].

Comparison of the Measurements of the Crania from Kültepe with those from Anatolia, Dating from 2000-1200 B. C.

The measurements of the skulls from Anatolia dating from 2000-1200 B. C. are shown in Table 10. The group labelled as "skulls from Central Anatolian Area" in this table, includes skulls from Kusura, Bozhöyük, Polatlı Höyük, Karaoğlan and Alişar Höyük [33].

[31] See Şenyürek, M. S. : Fluctuation of the cranial index in Anatolia, from the fourth millenium B. C. to 1200 B. C. Belleten, vol. XV, No. 60, 1951, p. 609.

[32] Ibid., p. 610.

[33] In an earlier study (Şenyürek, op. cit., 1951, p. 606) I explained this grouping as follows : "*I have divided the series from 2000-1200 B. C. into the Central and Peripheral Anatolian groups, as it is known that, although the Hittites had at various times formed an empire covering most of Anatolia and even including Syria, they were especially centered in Central Anatolia, where they were the strongest*".

The measurements of the skulls from Alişar Höyük, Chatal Höyük and Tell Al-Judaidah have been taken from Krogman [34], and those of Bozhöyük skull from Virchow [35]. The measurements of Tarsus and Troy VI crania are respectively from Ehrich [36] and Angel [37]. The Hittite period skull from Polatlı Höyük has been studied by me [38]. The skulls from Kusura and Karaoğlan had been originally published by other writers [39], but I have remeasured these skulls [40].

An examination of Table 10 shows that the male and female crania from Level III in Kültepe differ from the males of the central Anatolian area, that is, the Hittite area, in having a much longer

[34] Krogman, W. M. : Cranial types from Alişar Hüyük and their relations to other racial types, ancient and modern, of Europe and western Asia. In von der Osten's : Alishar Hüyük, seasons of 1930-1932. Part III. OIP, vol. XXX, Researches in Anatolia - vol. IX, Chicago, 1937, pp. 213-293; (b) Krogman, W. M. : Ancient cranial types at Chatal Höyük and Tell Al-Judaidah, Syria, from the late fifth millenium B. C. to the mid-seventh century, A. D. Belleten, vol. XIII, No. 51, 1949, pp. 407-477.

[35] Virchow, R. : Funde aus dem nordwestlichen Phrygien und von Salonik. Verhandlungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, 1896, pp. 123-126.

[36] Ehrich, R. W. : Preliminary notes on Tarsus crania. American Journal of Archaeology, vol. XLIV, No. 1, 1940, pp. 87-92.

[37] Angel, J. L. : Troy. The human remains. Supplementary monograph 1. Princeton University Press for the University of Cincinnati, 1951.

[38] Şenyürek, M. S. : A study of human skulls from Polatlı Hüyük. Anatolian Studies, vol. I, 1951, pp. 63-71.

[39] Kansu, Ş. A. and Atasayan, M. : Afyonkarahisar Kusura hafriyatında meydana çıkarılan Bakır çağı ve Eti devirlerine ait iskeletler üzerine tetkikler (Recherches sur les squelettes de l'Âge du Cuivre et de l'époque Hittite, decouverts dans les fouilles de Kusura, aux environs d'Afyonkarahisar). Türk Antropoloji Mecmuası (Revue Turque d'Anthropologie), No. 19-22, 1939, pp. 272-289; Kansu, Ş. A. and Tunakan, S. : Karaoğlan höyüğünden çıkarılan Eti, Frik ve Klâsik devir iskeletlerinin antropolojik incelenmesi (Etude anthropologique des squelettes datant des époques Hittite et Phrygienne et de l'Âge classique, provenant des fouilles du Höyük de Karaoğlan, 1937-1938). Belleten, vol. XII, No. 48, 1948, pp. 759-774 and 775-778.

[40] In their study on the skull from Karaoğlan (No. II) Kansu and Tunakan (op. cit., 1948, Table 1) gave only the breadth (146 ? m.) and the porion-bregma height (108 mm.). I have recently restored the glabella region of the skull with the bone fragments preserved and measured the length which is 170 mm. The breadth and porion-bregma heights I have taken are the same as those given by the previous authors (see Şenyürek, op. cit., 1951, p. 612).

length, a narrower breadth and a much lower cranial index. The male skulls from Level III in Kültepe are approached, on the average, by the male crania from Chatal Höyük (See table 10), which is south of the Taurus range, that is in the peripheral Anatolian area. But still the crania from Chatal Höyük have a slightly shorter average length, a slightly wider breadth and a slightly higher cranial index than the skulls from Level III in Kültepe. On the other hand, the female crania from Chatal Höyük and Tell Al-Judaidah, which are, on the average, brachycephalic, strongly differ from the females from Level III of Kültepe in the cranial index. The female crania from Tarsus and Troy VI also differ from the female skulls from Level III in Kültepe in having higher cranial indices.

The male skull from Level III in Kültepe has a lower porion-bregma height-length index than the male skulls from Central Anatolian area and those from Chatal Höyük (table 10), although the latter do not differ much from the Kültepe skull in this respect. The skull of the female individual from Level III in Kültepe is not much different from the female skulls of Central Anatolian area but shows a higher index than the females from Chatal Höyük and Tell Al-Judaidah and a lower index than that from Tarsus. In the upper facial index, the male skull from Level III in Kültepe does not differ much from the average of the males of Central Anatolian group.

As for the skulls from Level II in Kültepe, the male skull exceeds the males from the Hittite area in length, and breadth but approaches their average in the cranial index. In length this male skull comes close to the average of the male skulls from Chatal Höyük, although it is somewhat longer, but far exceeds them in breadth and cranial index. The female skulls from Level II in Kültepe, on the average, are a bit longer and broader than the female skulls from Central Anatolian area, Chatal Höyük and Tell Al-Judaidah, Tarsus and Troy VI, but do not differ much from some of them in the cranial index. Indeed, in cranial index they are very close to the females from the Hittite area (Central Anatolian area). In porion-bregma height-length index the male skull from Kültepe has a lower index than the male crania from Central Anatolian area and Chatal Höyük. On the other hand,

the female crania, on the average, have a higher index than the females from Central Anatolian area, Chatal Höyük and Tell Al-Judaidah and a lower index than that from Tarsus. In upper facial index the one female skull from Level II in Kültepe exceeds that from Troy VI and somewhat surpasses the one female from Central Anatolian area.

It is seen that the longheaded skulls from Level III in Kültepe, which probably represent the Assyrian merchants, greatly differ from the skulls of Central Anatolian group, that is from the skulls of the known Hittite area. On the other hand, in Level II in Kültepe, the cranial index increases and the measurements and indices of the skulls, especially those of the females, comes very close to the females of the Central Anatolian group.

Dr. W. M. Krogman, in his admirable studies of 1933 and 1937 on the crania from Alişar Höyük showed that at Alişar the Mediterranean dolichocephals had antedated the brachycephals [41]. In his study of 1937 Dr. Krogman summed up the situation at Alişar Höyük as follows : "... *Alişar Copper Age and Phrygian present a longheaded type, Alişar Early Bronze Age and Hittite Empires a roundheaded type*"[42]. Subsequently in a study on the craniology of the Chalcolithic, Copper Age and Hittite period inhabitants of Anatolia [43], based on a larger series of crania coming from various parts of Anatolia, I was able to show that the majority of the Chalcolithic and Copper Age inhabitants of Anatolia were dolichocephals of Eurafrican and Mediterranean types and that the brachycephals, who probably represented the invaders, were rare in these periods [44]. In this paper I

[41] (a) Krogman, W. M. : The cranial types. In E. F. Schmidt's : The Alishar Hüyük, seasons of 1928 and 1929. Part II. OIP., vol. XX, Researches in Anatolia, vol. V, Chicago, 1933, p. 131; (b) Krogman, W. M. : op. cit., 1937.

[42] Krogman, W. M. : op. cit., 1937, p. 216.

[43] Şenyürek, M. S. : Anadolu Bakır Çağı ve Eti sekenesinin kraniyolojik tetkiki (A craniological study of the Copper Age and Hittite populations of Anatolia). Belleten, vol. V, No. 19, 1941, pp. 219-253.

[44] It is well-known that von Luschan (1911), Eugene Fischer (1923) and Şevket Aziz Kansu (1943) had formerly assumed that the earlier populations of Anatolia were roundheaded. However, this hypothesis has now been completely disproved. For this abandoned hypothesis see : (a) von Luschan, F. : The early inhabitants of western Asia. The Journal of the Royal Anthropological Institute of Great Britain and Ireland, vol. XLI. 1911, pp. 221-244; (b) Fischer, E. "Spe-

concluded : "*The evidence indicates that about 2000 B. C. a new invasion took place in Anatolia. This was made by the Hittites who were predominantly of Alpine stock. The craniological evidence, however, suggests that the Hittite invaders did not annihilate the native population they found in Anatolia, but on the contrary mixed with them and tried to assimilate them.*"[45]

Thus it is known that brachycephaly was rare among the Chalcolithic and Copper Age inhabitants of Anatolia and that it became much more prevalent in the succeeding Hittite period [46]. It has already been observed that the cranial index increases in Level II in Kültepe and that the measurements and indices of the skulls, particularly those of the females, come close to those from Central Anatolian area, that is to those from the Hittite area. Thus, the craniological evidence, as I stated before [47], suggests that the Hittites had probably already arrived in Anatolia at the time when the Assyrian trading colony was flourishing in Kültepe. As I stated before [48], there is also some literary evidence in this regard, as Dr. Sedat Alp, Professor of Hittitology in the University of Ankara, has already concluded from an analysis of the names of some native Anatolians that the Hittites were established in Anatolia at the time of the Assyrian trading colony at Kültepe [49].

zielle Anthropologie : Rassenlehre", Anthropologie, unter Leitung von G. Schwalbe und E. Fischer "Die Kultur der Gegenwart" Hrsg. von F. Hinneberg, 3 Teil, 5 Abt., Leipzig and Berlin, 1923(Not available to me. Cited by Krogman, op. cit., 1937, p. 279); Kansu, Ş. A. : Selçuk Türkleri hakkında antropolojik ilk bir tetkik ve neticeleri. İkinci Türk Tarih Kongresi, İstanbul, 20-25 Eylül, 1937. Türk Tarih Kurumu Yayınlarından, IX. Seri, No. 2, İstanbul, 1943, pp. 443-444 and 456. (Translation: Kansu, Ş. A. : A first anthropological study on the Seljuk Turks and its results. Second Turkish Historical Congress, İstanbul, September 20-25, 1937. Publications of the Turkish Historical Society, series IX, No. 2, İstanbul, 1943, pp. 443-444 and 456).

Also for a discussion of the history of the contributions made to the physical anthropology of the ancient inhabitants of Anatolia see: Şenyürek, M. S. : A note on the human skeletons in the Alaca Höyük Museum. Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Dergisi (Revue de la Faculté de Langue, d'Histoire et de Géographie, Université d'Ankara), vol. IX, No. 1-2, 1951, pp. 52-55.

[45] Şenyürek, M. S.: op. cit., 1941, p. 245. For the time of arrival of brachycephalic elements into Anatolia see also Şenyürek, M. S.: op. cit., 1951, pp. 614-615.

[46] Ibid., pp. 609-610.

[47] Ibid., p. 610.

[48] Ibid., p. 610.

[49] Alp, S. : Hititlerde sosyal sınıf Nam. Ra'lar ve ideogramın Hititçe karşı-

From an examination of Table 10 it is seen that the brachycephalic tendency occurs especially among the females of Level II in Kültepe and that in Chatal Höyük — Tell Al-Judaidah series, the females are, on the average, brachycephalic while the males are longheaded. How are we going to explain this particular prevalence of brachycephaly among the females from Level II in Kültepe and Chatal Höyük — Tell Al-Judaidah in which they resemble the females from Central Anatolian area, where both the males and females are roundheaded ? Again the finds made at Kültepe where a large number of tablets have been found give a clue to this problem [50]. For it is known from the philological sources that some of the Assyrian merchants established in Kültepe had married natives [51]. Thus, as I suggested before, it seems probable that some of these Assyrian merchants had married Hittite women [52]. The mesocephalic male skull from Level II in Kültepe is probably the result of such a mixture [53].

lığı. Belleten, vol. XIII, No. 50, 1949, pp. 269-270; Alp, S. : Die Soziale Klasse der Nam. Ra-Leute und ihre hethitische Bezeichnung. Jahrbuch für Kleinasiatische Forschung, vol. I, Heft 2, 1950-51, pp. 125-126.

Note: In a subsequent study, published in 1950, Dr. Kurt Bittel (Bittel, K.: Hethiter und Proto-Ḫattier : Eine archäologische Betrachtung. Historia, vol. 1, Heft 2, 1950, p. 283) has stated : "*Der Gedanke liegt nahe, dass es die Hethiter waren, die diesen Wandel mit heraufführten, und dass eben aus den geschilderten Gründen ihre Einwanderung in eine Zeit zu verlegen ist, die nach oben spätestens durch das 20., nach unten, also rückwärts, durch das 22. Jahrhundert v. Chr. abgegrenzt wird*". Thus we see that the archaeological evidence also points in the same direction with the philological evidence.

[50] For a discussion of this problem and for the statistical treatment of the differences in length, breadth measurements and cranial index between the skulls from the Central Anatolian Area (Hittite area) and those from the peripheral Anatolian area see Şenyürek, M. S. : op. cit., 1951, pp. 606-610.

[51] (a) Bilgiç. E. : Kapadokya tabletlerine göre Anadolu Kavimleri üzerinde araştırmalar. Ankara Üniversitesi Dil ve Tarih - Coğrafya Fakültesi Dergisi (Revue de la Faculté de Langue, d'Histoire et de Géographie, Université d'Ankara), vol. II, No. I, 1943, p. 34; (b) Bilgiç. E. : op. cit., 1948, p. 513; (c) Bilgiç, E. : Hititlerden önceki Anadolu halkının evlilik hukukunun orijinal tarafları. Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Dergisi (Revue de la Faculté de Langue, d'Histoire et de Géographie, Université d'Ankara), vol. IX, No. 3, 1951, pp. 227-238.

[52] Şenyürek, M. S. : op. cit., 1951, p. 610.

[53] As I stated before (op. cit., 1951, p. 610) it must not be assumed that all

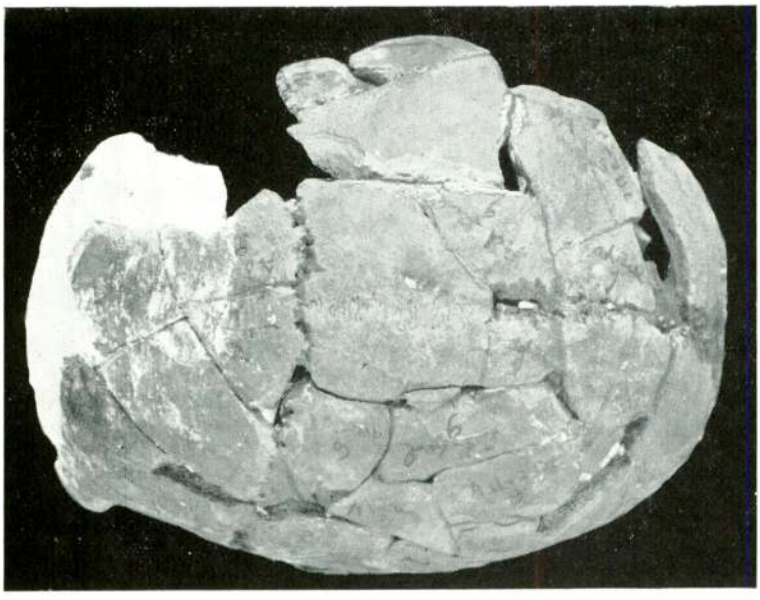

Fig. 1 — Skull No. 9 in norma verticalis (House of Adad-Sululi).

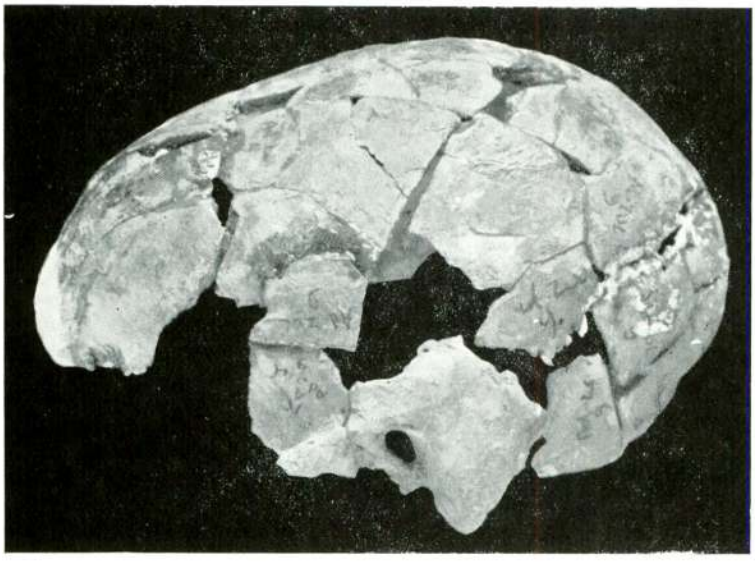

Fig. 2 — Skull No. 9 in norma lateralis (House of Adad-Sululi)

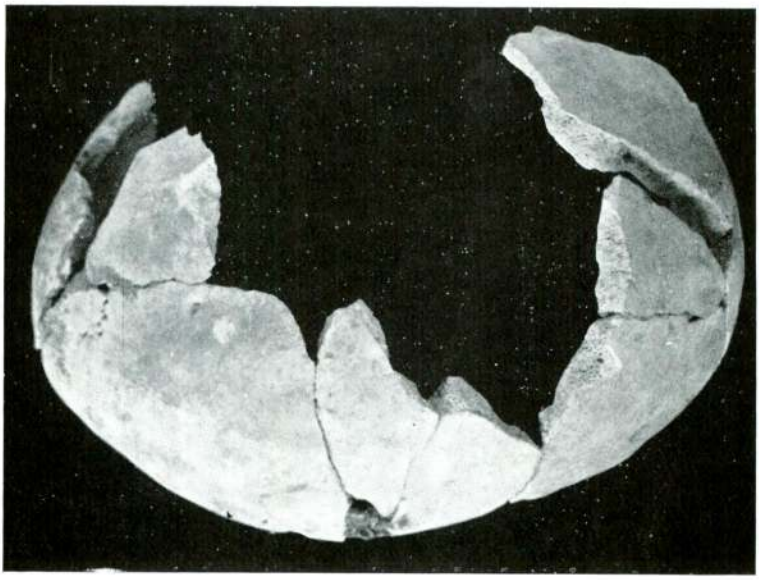

Fig. 3 — Skull No. 11 in norma verticalis (House of Adad-Sululi).

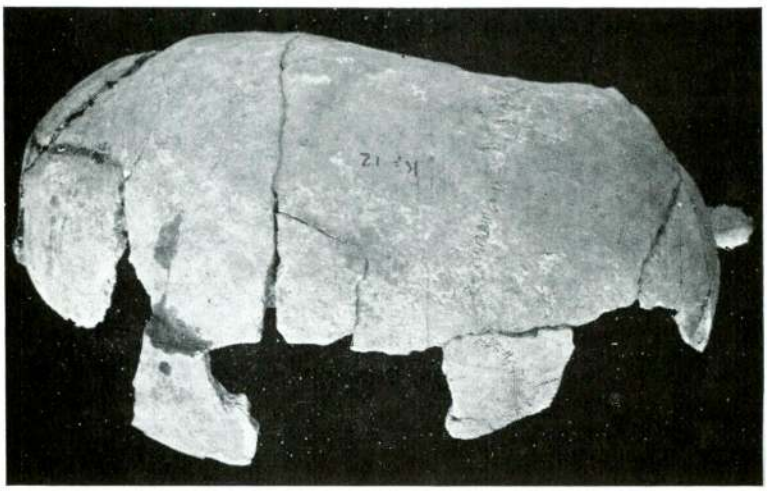

Fig. 4 — Skull No. 12 in norma verticalis (House of Adad-Sululi).

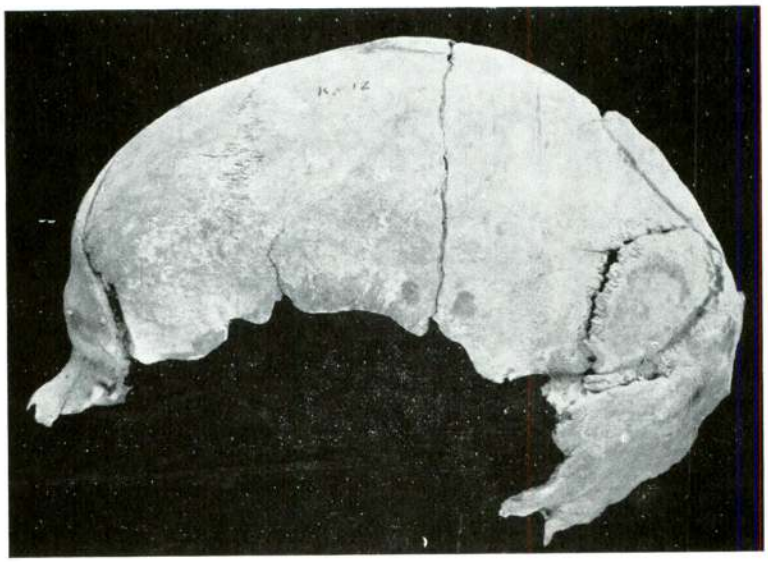

Fig. 5 — Skull No. 12 in norma lateralis (House of Adad-Sululi).

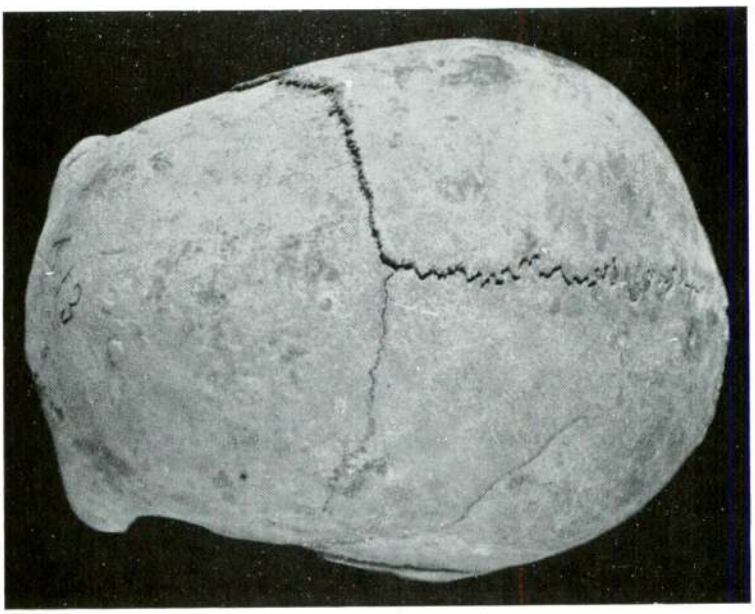

Fig. 6 — Skull No. 13 in norma verticalis (House of Adad-Sululi).

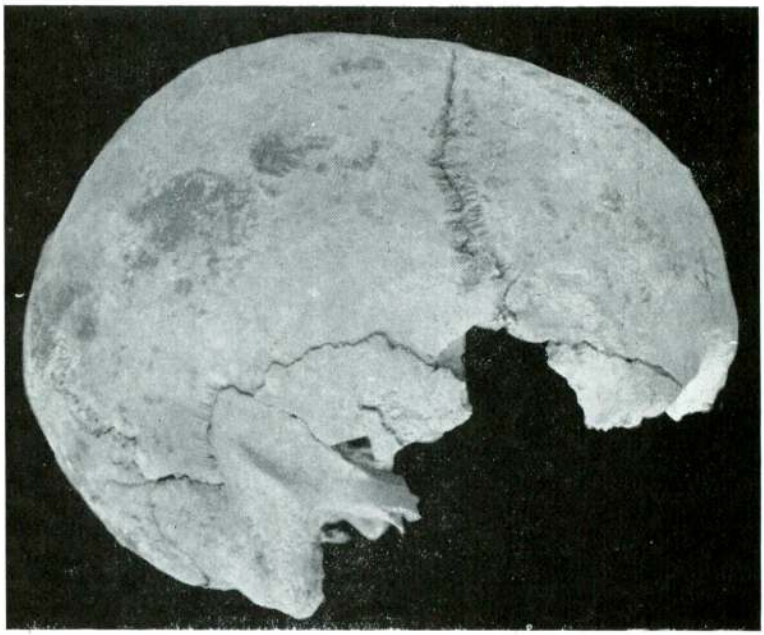

Fig. 7 — Skull No. 13 in norma lateralis (House of Adad-Sululi).

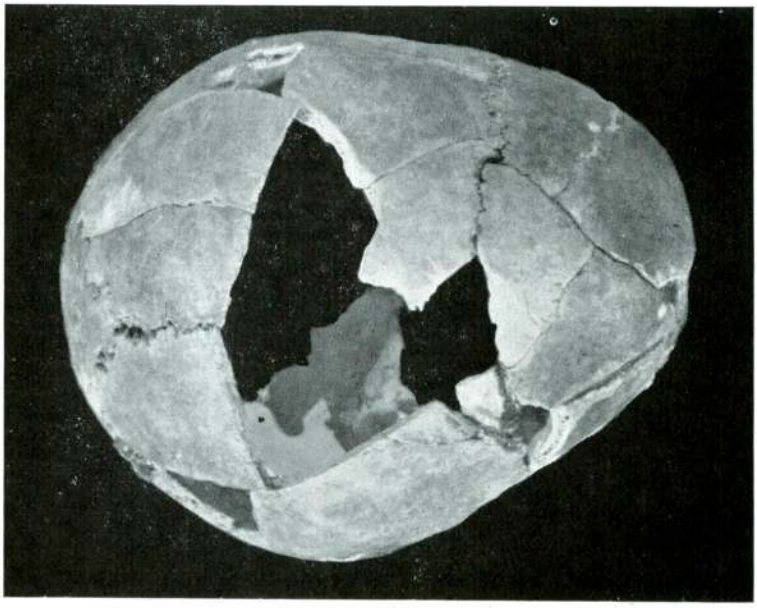

Fig. 8 — Skull No. 14 in norma verticalis (House of Adad-Sululi).

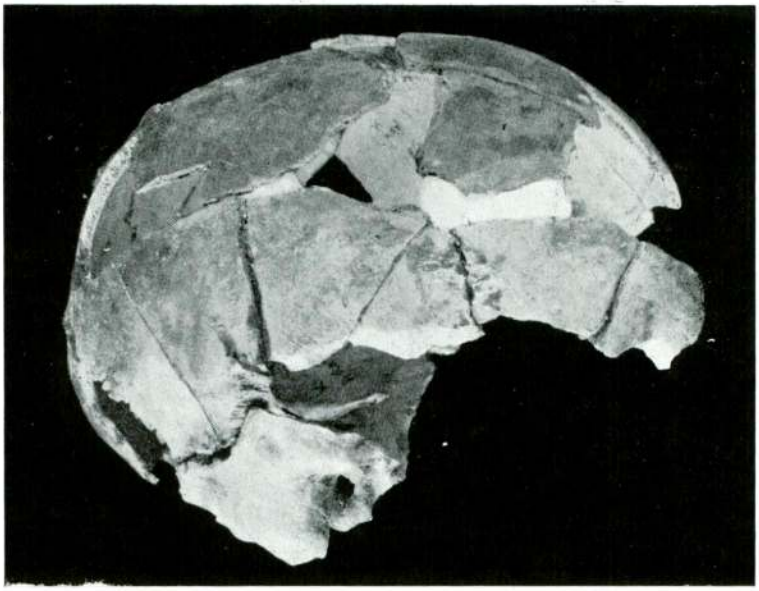

Fig. 9 — Skull No. 14 in norma lateralis (House of Adad-Sululi).

Fig. 10 — Skull No. 2A in norma verticalis (House of Uzua).

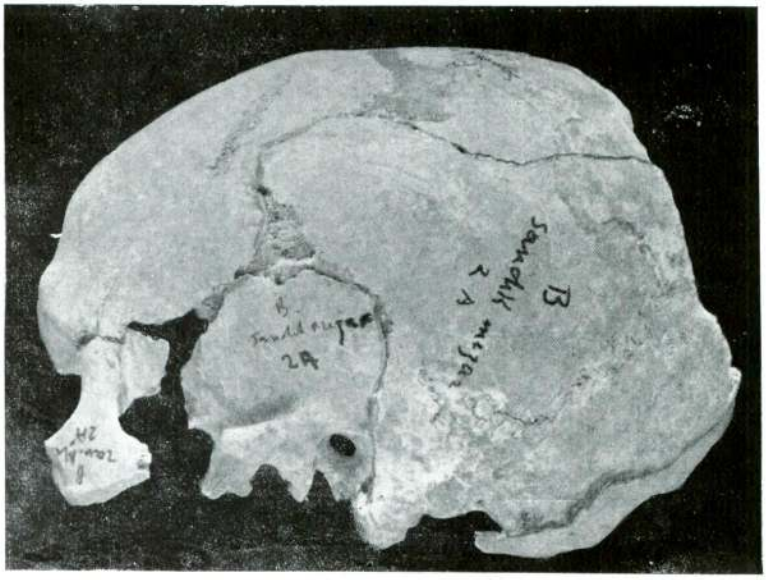

Fig. 11 — Skull No. 2A in norma lateralis (House of Uzua).

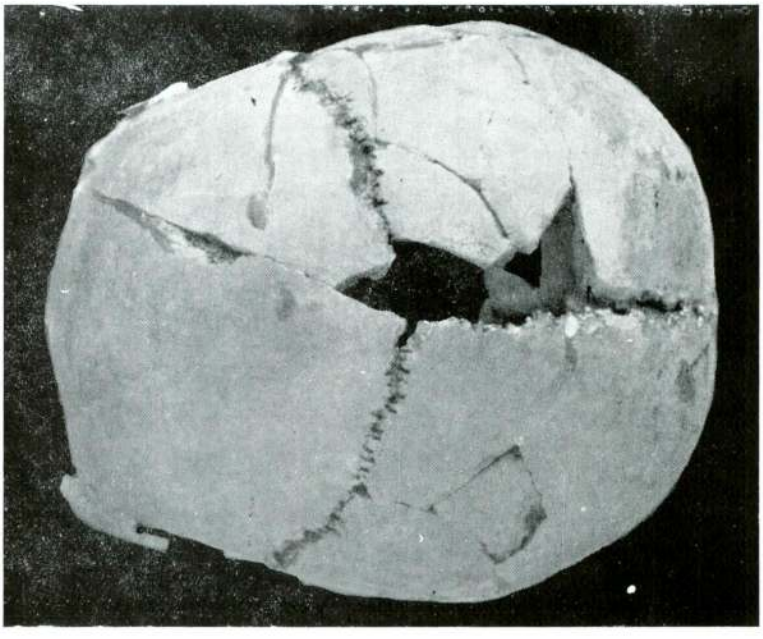

Fig. 12 — Skull No. 6a in norma verticalis (House of Laqipum).

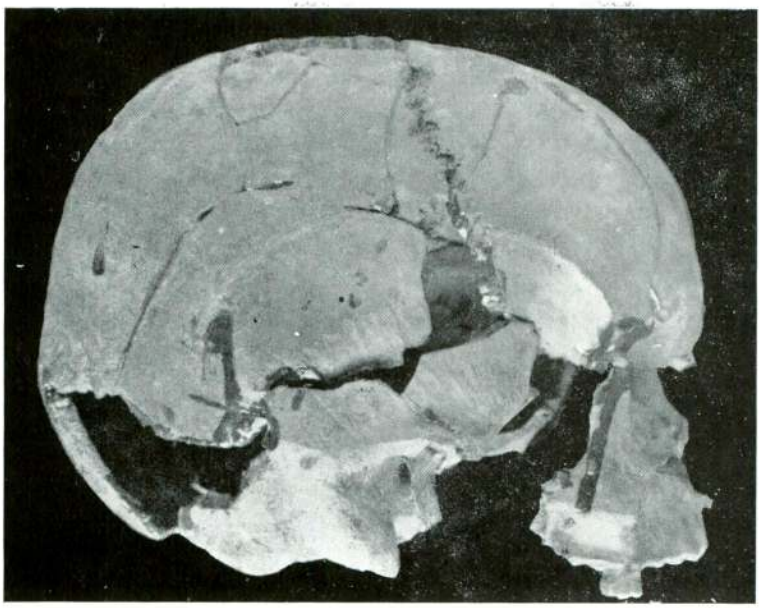

Fig. 13 — Skull No. 6a in norma lateralis (House of Laqipum).

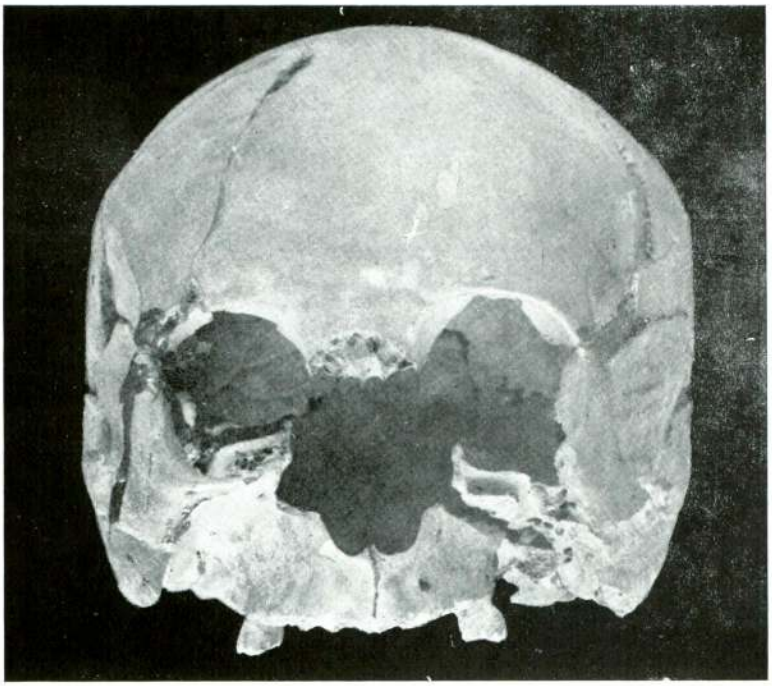

Fig. 14 — Skull No. 6a in norma frontalis (House of Laqipum).

The skulls from Chatal Höyük and Tell Al-Judaidah studied in this report date from phases M and M-N, which according to Dr. Krogman [54] correspond to 1600-1200 B. C., that is roughly to the time when the Hittite power was supreme in Anatolia. Thus, I consider it probable that some of the men from this region south of the Taurus range also had married Hittite women.

Summary and Conclusion

1. The crania from Kültepe, which was the site of an Assyrian trading colony at the beginning of the second millenium B. C., belong to two main types : Eurafrican and Alpine. The mesocephalic skulls from this site probably represent a mixture of these two types.

2. In passing from Level III to Level II in Kültepe the cranial index increases. The craniological evidence suggests that the Hittites had probably already arrived in Anatolia at the time the Assyrian trading colony was flourishing in Kültepe. In this respect the craniological evidence is in harmony with the philological [55] and archaeological evidence [56] that the Hittites had been established in Anatolia at that remote time.

3. The craniological evidence suggests that some of the Assyrian merchants at Kültepe had married Hittite women.

of these merchants had married Hittite women as some had certainly married Assyrian women (See Bilgiç, 1951, p. 229) and some may have married the descendants of the longheaded Chalcolithic and Copper Age inhabitants of Anatolia.

[54] Krogman, W. M. : op. cit., 1949, table 1. Krogman (op. cit., 1949, table 1) calls this period "*Levanto-Mycenaean*".

[55] See Alp. S : op. cit., 1949, pp. 269-270 and 1950-51, pp, 125-126.

[56] See Bittel, K. : op. cit., 1950, p.283.

TABLE 2

Skulls from Level II in Kültepe (Skulls from the Houses of Uzua and Laqipum)

	Male	Females		
	No. 2A	No. 4	No. 6a	Average
Glabello-occipital length	194.00+	177.00??	178.00	177.50
Maximum width	152.00	139.50	148.50	144.00
Minimum frontal diameter	—	—	100.00	100.00
Porion-bregma height	111.00	115.00	115.00	115.00
Mean thickness of parietal	6.20	5.30	4.30	4.80
Horizontal circumference	—	—	522.00	522.00
Transverse arc	—	—	315.00	315.00
Bizygomatic diameter	—	—	123.00?	123.00?
Nasion-prosthion length	—	—	64.50?	64.50?
Orbit width (Dacryon-ectoconchion)	39.00	—	39.00?	39.00?
Orbit height	32.00	—	35.00?	35.00?
Nasal length	—	—	48.00?	48.00?
Nasal width	—	—	22.00+	22.00+
Palate-external length	—	—	41.00+	41.00+
Palate-external width	—	—	60.50	60.50
Cranial index	78.35	78.81	83.42	81.11
Po-b-length index	57.21	64.40	64.60	64.50
Po-b-breadth index	73.02	82.43	77.44	79.93
Fronto-parietal index	—	—	67.34	67.34
Upper facial index	—	—	52.43?	52.43?
Cranio-facial index	—	—	82.49	82.49
Zygo-frontal index	—	—	81.30	81.30
Orbital index	82.05	—	89.74	89.74
Nasal index	—	—	45.83	45.83
External palatal index	—	—	147.56	147.56

TABLE 3

Skulls from Levels II and III in Kültepe (Skulls from the houses of Adad-Sululi, Uzua and Laqipum)

	♂	♀	♂ and ♀
Glabello-occipital length	(4) 196.00	(4) 179.75	(8) 187.87
Maximum width	(4) 141.75	(4) 140.25	(8) 141.00
Minimum frontal diameter	—	(2) 98.50	(2) 98.50
Porion-bregma height	(2) 111.50	(3) 115.00	(5) 113.60
Mean thickness of parietal	(4) 5.45	(3) 5.20	(7) 5.34
Horizontal circumference	—	(2) 518.50	(2) 518.50
Transverse arc	—	(2) 311.50	(2) 311.50
Bizygomatic diameter	(1) 125.00?	(1) 123.00?	(2) 124.00?
Nasion-prosthion length	(1) 64.00	(1) 64.50?	(2) 64.25?
Orbit width (Dacryon-ectoconchion)	(3) 39.66	(1) 39.00?	(4) 39.50
Orbit height	(3) 31.00	(1) 35.00	(4) 32.00
Nasal length	(1) 50.00?	(1) 48.00? [1]	(2) 49.00? [2]
Nasal width	(1) 24.00?	(2) 23.50 [3]	(4) 23.62 [4]
Palate-external length	—	(1) 41.00	(1) 41.00
Palate-external width	—	(1) 60.50	(1) 60.50
Cranial index	(4) 72.41	(4) 78.11	(8) 75.26
Po-b-length index	(2) 57.62	(3) 63.49	(5) 61.14
Po-b-breadth index	(2) 75.67	(3) 82.11	(5) 79.53
Fronto-parietal index	—	(2) 70.13	(2) 70.13
Upper facial index	(1) 51.2 ?	(1) 52.43	(2) 51.81
Cranio-facial index	(1) 93.28	(1) 82.49	(2) 87.88
Zygo-frontal index	—	(1) 81.30	(1) 81.30
Orbital index	(3) 78.19	(1) 89.74?	(4) 81.07
Nasal index	(1) 48.00?	(1) 45.83?	(2) 46.91
External palatal	—	(1) 147.56	(1) 147.56

[1] One individual.
[3] Two individuals.
[3] Three individuals.
[4] Four individuals.

TABLE 6

Measurements and Indices of the Tibiae from Kültepe (Tibiae from the Houses of Adad-Sululi, Uzua and Laqipum)

	House of Adad-Sululi				House of Uzua	House of Laqipum	Average
		No. 10					
	No. 12	1	2	No. 13	2 B Subad.	6 a	($\bigcirc^{\nearrow}$ and $\bigcirc_{+}$)
a. Maximum length	—	—	—	330.00	327.00	—	328.50
b. Antero-posterior diameter at the level of foramen nutricium	33.00	32.50	34.00	31.00	28.00	26.00	30.75
c. Breadth (lateral) at the level of foramen nutricium	21.50	22.00	25.00	24.00	22.00	19.50	22.33
d. Antero-posterior diameter at the middle of diaphysis	—	—	—	27.50	25.00	—	26.25
e. Breadth (lateral) at the middle of diaphysis	—	—	—	21.00	20.00	—	20.50
f. Circumference in the middle	—	—	—	77.00	71.00	—	74.00
g. Minimum circumference of diaphysis	—	—	—	74.00	67.00	—	70.50
Index cnemicus $\left(\frac{c \times 100}{b}\right)$	65.15	67.53	73.52	77.41	78.57	75.00	72.86
Middle index $\left(\frac{e \times 100}{d}\right)$	—	—	—	76.36	80.00	—	78.18
Length-thickness index $\left(\frac{g \times 100}{a}\right)$	—	—	—	22.42	20.48	—	21.45

TABLE 7

Maximum Lengths of Other Post-Cranial Bones from Kültepe (Post-Cranial Bones from the Houses of Adad-Sululi, Uzua and Laqipum)

	House of Adad-Sululi	House of Uzua		House of Laqipum		
	No. 10	2 A	2 B Subad.	No. 4	6b	6a
Clavicula	133.00	138.00??	—	—	138.50	—
Humerus	—	—	295.00	291.50	—	—
Radius	—	—	—	—	242.50	215.00
Ulna	—	—	—	238.00	—	—

TABLE 8

The Statures Calculated from the Maximum Lengths of the Long Bones According to Pearson's Formulae [1]

The Formulae	House of Adad-Sululi		House of Uzua	House of Laqipum		
	No. 10 (♀)	No. 13 (♀)	2B (♀)	No. 4 (♀)	6b (♂)	6a (♀)
72.844+1.945 femur =	163.67	—	—	152.29	—	152.83
74.774+2.352 tibia =	—	152.39	151.68	—	—	—
71.475+2.754 humerus =	—	—	152.71	151.75	—	—
85.925+3.271 radius =	—	—	—	—	165.24	—
81.224+3.343 radius =	—	—	—	—	—	153.09
67.435+1.339 femur +1.027 humerus	—	—	—	152.07	—	—

[1] The formulae are from R. Martin : Lehrbuch der Anthropologie, Vol. II, 1928, pp. 1070-1071.