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A NOTE ON THE SKULLS OF CHALCOLITHIC  
AGE FROM YÜMÜKTEPE

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During the course of excavations at Yümüktepe, which is close to Mersin, carried out by the Neilson Expedition, several human skeletons of Chalcolithic Age were found and sent to me for study.<sup>1</sup> In this connection I wish to express my thanks to Prof. John Garstang, the Director of the Expedition and to Mr. Necati Dolunay, for entrusting the description of these skeletons to me.

The material sent to me was in fragments. Of these, I have been successful in reconstructing three skull caps, all of which belong to the Chalcolithic Age.<sup>2</sup> With these were also sent to me some broken

<sup>1</sup> Among the material sent to me there are some fragments of an unnumbered skull, a palate of reddish color with permanent teeth, again without a number, and a fragment of an unnumbered right corpus mandibulae of a child with the first and second milk molars *in situ*. As the provenance of these remains is not known, they are not dealt with in this report. Likewise a calva, which, according to the information kindly given to me by Prof. Garstang during his visit to my laboratory in the summer of 1951, is from a "*superficial deposit*" is also left out.

<sup>2</sup> These three skulls were taken into consideration in my study on "The Longevity of the Chalcolithic and Copper Age inhabitants of Anatolia" published in

long bones, of which I have restored a few. But as I could not determine with certainty to which one of the skulls these long bones belong and from what levels they were derived, this study is confined to the description of only the crania. These remains are examined below in their chronological order, that is from the oldest toward the youngest.

#### THE CALVA FROM LEVEL XXIV - XXIII

This calva (figs. 1 and 2) carries the field number of H. 5 and, according to the information kindly given to me by Mr. Dolunay, it belongs to level XXIII, that is, to the earliest phase of Early Chalcolithic.<sup>3</sup> Regarding this calva, however, Garstang states: "*The detached skull was found in the adjoining Area 275 at level 9.88 m., i.e. more than a metre above this interment, and 5 to 6 metres distant outside the wall of the surrounding building. Though the frontal bone was broken away Prof. Şenyürek thinks that it was probably that of a female: It is possible therefore that it had belonged to this burial in Room 279.*"<sup>4</sup> That is, according to Garstang, it may belong to level XXIV.<sup>5</sup> But whether it belongs to level XXIV, which is Proto-Chalcolithic, or to level XXIII which is early Chalcolithic, still this skull at the least is one of the earliest Chalcolithic skulls found to date in the soil of Anatolia.

This individual is represented by a fragmentary calva (figs. 1 and 2), in which are preserved a large part of os occipitale, a large part of left os parietale and a large portion of the posterior half of right os parietale.<sup>6</sup> Of os frontale a large part, including the median

1951 (Şenyürek, 1951c, p. 462). On the other hand, in my study entitled "Fluctuation of the Cranial Index in Anatolia, from the Fourth Millenium B.C. to 1200 B.C." published in the same year (Şenyürek, 1951c, table 1) only the skulls from levels XIX and XIX-XVIII were measured and that from level XXIV-XXIII was not included as at that time the forehead of this calva was not yet restored. The restoration of the forehead of this calva was achieved subsequently, after an intervening fragment was found.

<sup>3</sup> For the subdivisions of Chalcolithic Age at Yümüktepe see: Garstang, 1953, p. 2.

<sup>4</sup> Ibid., p. 54.

<sup>5</sup> Ibid.

<sup>6</sup> It may be mentioned here that with the bones of this skull is also present a fragment of corpus mandibulae of a *Sus scrofa*, including two teeth.

portion of the bone down to the glabella region and the lateral half of the upper margin of the right orbit are retained. In the median portion of the bone the medial parts of the upper margins of the right and left orbits are also present. In the glabella region the *lamina externa* is broken and missing, while *diploë* and the *lamina interna* are retained. Thus it was easy to restore the glabella with a thin coating of Plaster of Paris and the length measured on this restoration is probably very near the actual dimension.

The sutura sagittalis, sutura coronalis and sutura lambdoidea are completely open on both the endocranial and ectocranial aspect of the calva. The same is also true of sutura occipitomastoidea. In this calva the muscle markings on os occipitale and the lineae temporales, on the right side of frontale, are very weak. The mastoid process, preserved in a fragment of the left os temporale which could not be fitted to the calva as its squamous portion is missing, is also small. The morphology of the calva and the condition of the sutures indicate that this calva belongs to a female just under 20 years of age.

The length and breadth measurements and the cranial index of this calva are as follows :

Glabello-occipital length:	196.00 mm.
Maximum breadth	: 133.00 mm.
Cranial index	: 67.85

As can be seen from the above figures, this calva is very long and hyperdolichocephalic. The bones of the calva are of moderate thickness for a female.

The form of the calva in norma verticalis is nearly ovoid. The forehead, which is of medium height, shows a rather pronounced slope. The frontal sinuses are small, and are confined to the glabella region. The metopic suture is closed in the preserved middle part of the frontal bone. There is seen a very slight sagittal elevation (crest) in the middle part of the frontal bone. The frontal eminence, on the right side, is of medium development. The postorbital constriction is above average. There is a postcoronal depression of medium development behind the coronal suture. In the parietal region there is no sagittal elevation and the parietal foramen, preserved on the left side, has a maximum transverse diameter of 2 mm.

In the preserved fragment of os temporale, the depth of the man-



dibular fossa (glenoid fossa) and the size of the postglenoid process are above average. On the other hand, the articular tubercle is of moderate development. In *norma lateralis*, the occiput is moderately curved. The lambdoid flattening is very slight and there is no plano-occipital flattening. There is no occipital torus whatsoever.

This calva represents an individual of the big-headed and dolichocephalic Eurafrian type.

#### THE CALVA FROM LEVEL XIX

This individual, represented by a broken calva (figs. 3-4), a fragment of maxilla (fig. 5) and a broken mandible (fig. 6), carries the field number of H. 2 and belongs, according to the information given by Mr. Dolunay, to level XIX, that is to the early part of Garstang's Middle Chalcolithic period. The information given to me by Mr. Dolunay about the condition of the burial, when it was found, clearly shows that these represent Carstang's individual No. iv from level XIX.<sup>7</sup>

In the calva are preserved the largest portion of os occipitale, largest part of the left os parietale and a part of the right parietal bone. Of os frontale the middle portion of its upper part, extending to just below *metopion*, is preserved, while the part containing glabella and the brow ridges is missing. I have restored the glabella region with Plaster of Paris. As the *metopion* region is preserved, showing the slope of the forehead, the glabello-occipital length measured on this restoration probably comes near to the actual one. In the mandible are preserved the corpus mandibulae and the left ramus mandibulae, which lacks the condyle. The right ramus mandibulae is missing. Together with this mandible there is a small fragment of left maxilla with the three upper molars *in situ*.

Sutura sagittalis, sutura coronalis and sutura lambdoidea are completely open on both the inside and outside of the calva. The left upper and the left lower wisdom teeth had just started erupting, while the right lower wisdom tooth was still in its socket and unerupted. The calva is small and the muscle markings on its surface are weak. It appears that these remains belong to a female of about 16-18 years of age.

<sup>7</sup> Garstang, 1953, p. 110.

The measurements and the cranial index of this calva are as follows :

Glabello-occipital length	: 168.00 mm.?
Maximum breadth	: 122.00 mm.
Cranial index	: 72.61?

As can be seen from these figures, the calva is small and dolichocephalic. The bones of the calva are of moderate thickness. The form of the calva, in *norma verticalis*, is pentagonoid. As can be judged from the preserved portion of *os frontale*, the slope of the forehead is slight and is much less than that of the skull from level XXIV - XXIII. The metopic suture is completely closed in the preserved upper part of *os frontale*. But as the glabella region is missing, it is not known whether this suture had also closed in this part or not. On the left side of the skull a slight degree of postcoronal depression is observed. The parietal eminence, on the left side, shows a moderate development. In *norma lateralis*, the occiput is well curved. There is seen a lambdoid flattening of moderate degree, but there is no plano-occipital flattening. There is no torus occipitalis on the occipital bone.

The measurements of the mandible are listed in Table 1. As compared with the values of recent man listed by Martin, <sup>8</sup> the height-thickness index of the corpus mandibulae is high. Although, the bone is slightly thicker than the average of Parisians (13 mm.), <sup>9</sup> still this high index is mainly due to the low corpus height of this mandible.

In *norma lateralis* the chin projection is positive and shows a moderate development. The development of spina mentalis is weak. There is no trace of torus mandibularis. The gonial angles are slightly everted outward. On the right side the foramen mentale is single and is located under the anterior part of P<sub>4</sub>. On the other hand, on the left side the foramen mentale is under the middle of P<sub>4</sub>, that is, it is slightly more posterior in position than that on the right side. In addition, on the left side a tiny accessory orifice is observed under the canine, at a lower level than the foramen mentale.

The measurements and indices of the available teeth of this individual are listed in Tables 2 and 3. When the robustness values

<sup>8</sup> Martin, 1928, p. 979.

<sup>9</sup> Ibid., p. 979.



of these teeth are compared with those of a mixed series consisting of Europeans, ancient Egyptians, American Indians, Negroes and Melanesians, which I had measured at Harvard University, <sup>10</sup> it is seen that, with the exception of the lower canine, the Yümüktepe teeth are smaller than those of this mixed series. As the upper and lower third molars were still in their alveoli, they were not extracted and measured. But it is clearly seen that the upper and lower wisdom teeth are smaller respectively than the upper and lower second molars. That is, in both the upper and lower jaw of this individual the size of the molars diminishes from the first toward the third molar. It is known that this is an advanced character.

The shape of the first upper molar, in occlusal view, is rhomboidal (fig. 5). This tooth has four cusps. In this tooth the hypocone is well developed. The crista obliqua and the oblique groove also are well formed. The second upper molar shows a triangular shape with only three cusps. In this tooth the hypocone has disappeared while the crista obliqua is still retained. The third upper molar also presents a triangular shape and three cusps. In this tooth, in addition to the disappearance of hypocone, the crista obliqua also has been lost. There is no Carabelli cusp or Carabelli pit in any one of the preserved upper molars.

As for the mandibular teeth, the first lower molar has five cusps (fig. 6). The hypoconulid (mesoconid) of this tooth is median in position and is of medium development. This tooth, on both sides, shows a modified form of *Dryopithecus* pattern, described by Gregory. <sup>11</sup> The second lower molar has only four cusps. In this tooth the hypoconulid has been lost. The second lower molar, on both sides, shows the late Milo Hellman's plus pattern. <sup>12</sup> The third lower molar also has four cusps and no hypoconulid. In this tooth the entoconid is strongly reduced. The third lower molar also shows plus pattern.

<sup>10</sup> Şenyürek, 1946, table 2.

<sup>11</sup> Gregory, 1916 and 1920—1921.

<sup>12</sup> Hellman, 1928. For the crown patterns of lower molars of ancient inhabitants of Anatolia see Şenyürek, 1952a and b.

The upper and lower molars of this individual are slightly worn. The bite of this individual, as is shown by the attrition surfaces of the lower incisors, was of the over-bite type. There are no caries on any one of the available upper and lower teeth. However, on the disto-lingual corner of the hypocone of the first upper molar there is a defect in enamel, which would probably later on be the seat of caries.

Although the glabella region is missing, the small size and the morphological features of this calva indicate that it belongs to the Mediterranean racial type.

#### THE BURNT HUMAN TEETH FROM LEVEL XIX

This individual is represented by an isolated left upper second molar and a small fragment of mandible containing the root of the right lower canine and the first and second right lower premolars (fig. 7), belongs to level XIX and corresponds to Garstang's burial (vi).<sup>13</sup> The mandibular fragment and all the teeth preserved are burnt. Regarding this burial Garstang states: "*In Area 234 at Level XX was found an extensive deposit of burnt bones, some completely calcined white and others merely blackened; but all were found as soft as the earth in which they were embedded. No bones could be recognized with certainty, but some good teeth were collected; as these have proved to be human the deposit must rank as a mass cremation in situ*".<sup>14</sup> That is, this burial appears to be the earliest case of cremation reported to date from Anatolia.

There is a slight contact facet on the distal face of the crown of the upper second molar, showing that the upper third molar had erupted and functioned for at least some time. The upper molar and the lower premolars are moderately worn. From these it appears that these remains belong to an adult individual.

The measurements of the available teeth are shown in Table 4. The upper second molar and the lower first premolar of this individual are smaller than those of the mixed series referred to before, while the second lower premolar is larger. All three teeth of this individual are larger than the corresponding teeth of the skull from

<sup>13</sup> Garstang, 1953, p. 111.

<sup>14</sup> Ibid., p. 111.



Level XIX described previously and the premolars are bigger than those of the mandible of a male individual, the measurements of which are listed in Table 8, thus suggesting that these burnt teeth may belong to a male individual. The upper second molar has a rhomboidal shape, in occlusal view, and four cusps. In this tooth the hypocone is moderately developed. There is no Carabelli cusp or Carabelli pit in this tooth. This tooth possessed three separate roots of which the disto-buccal one is now broken.

THE CALVA FROM LEVEL XIX - XVIII <sup>15</sup>

This individual, represented by a calva (figs. 8-12), belongs to Level XIX-XVIII and corresponds to Garstang's burial (iii) from Level XVIII. <sup>16</sup> In this calva, which is nearly complete, the squamous portion of os occipitale, the right and left parietal bones and the largest part of the right and left temporal bones are preserved. Most of os frontale is also retained, with the exception of the glabella region which is broken. But as the greatest parts of right and left brow ridges are preserved, it was easy to restore the glabella with Plaster of Paris.

Pars bregmatica, pars verticis and pars obelica of sutura sagittalis are closed on the endocranial surface of the calva. On the ectocranial aspect of the calva pars bregmatica of this suture is still open whereas pars verticis is partly erased and pars obelica is mostly synostosed. On the other hand pars postica of the sagittal suture is open on both the inside and outside. Sutura coronalis and sutura lambdoidea are still open on both the internal and external surfaces of the calva. The sphenosquamosal, squamous, parietomastoid and the occipitomastoid sutures also are completely open on the endocranial and ectocranial aspects of the skull. In this calva the muscle markings are well developed and the brow ridges are exceptionally strong. The condition of the sutures and its morphological features show that this calva belongs to a male individual of about 28-29 years of age.

<sup>15</sup> This is the skull referred to in my earlier study (Şenyürek, 1951c, p. 598, footnote 35).

<sup>16</sup> Garstang, 1953, p. 110. The skull referred to by Garstang in footnote 1 on p. 111 is this calva (Garstang, 1953, p. 111). As this skull was found in Level XIX, Garstang attributes it to Level XVIII (Garstang, 1953, p. 110).



The measurements and indices of this calva are listed in Table 5.<sup>17</sup> This calva is very long and narrow and is hyperdolichocephalic. The porion-bregma height measured on the left side is smaller than that taken on the right side. This is due to the fact that the skull has been warped in the ground and its right side has been pushed downward (fig. 12). Taking the measurement on the left side, which is probably nearer the original height, the auricular height-length index of this calva is chamaecephalic and its auricular height-breadth index is akrocephalic. On the other hand, the measurement taken on the right side yields hypsicephalic height-length and akrocephalic height-breadth indices. The transverse fronto-parietal index expressing the minimum frontal diameter as a percentage of the maximum breadth is eurymetopic. The mean thickness of the parietal bone, measured about one centimeter above the squamous suture, is above average.

The cranial capacity of this individual calculated according to Pearson's  $359.34 + 0.000365 \times \text{length} \times \text{breadth} \times \text{auricular height}$  formula<sup>18</sup> is 1433.16 c.c.<sup>19</sup> That is, according to Sarasin's and Flower and Turner's classifications,<sup>20</sup> the cranial capacity of this Chalcolithic individual is in the medium category.

The form of this calva, in *norma verticalis*, is ovoid. The brow ridges are very strongly developed, approaching in size the brow ridges of some fossil *Homo sapiens* of Upper Palaeolithic period and those of modern Australian aborigines. The forehead, which is high, also shows a very strong degree of slope. The frontal bosses are weak. The postorbital constriction is pronounced. The metopic suture is completely synostosed in the preserved part of *os frontale*. On the midsagittal part of the frontal bone is seen a sagittal elevation (crest) of medium degree. The frontal sinuses of this calva are larger than those of skull No. H. 5 described before. The temporal fullness is medium. There is no postcoronal depression behind the coronal suture. The parietal bosses are weakly developed. In the parietal region is observed a strong sagittal elevation (crest) which gives the skull a scaphoid appearance (fig. 12). The temporal lines, on both

<sup>17</sup> Other measurements and indices of this calva are listed in table 6.

<sup>18</sup> See Martin, 1928, p. 647.

<sup>19</sup> The porion-bregma height of the left side has been used in this calculation.

<sup>20</sup> See Martin, 1928, p. 644.

the frontal and parietal bones, are well marked. The mastoid process is large and the supramastoid crest is strongly developed. The glenoid fossa is deep and the development of the postglenoid process is above average. The articular tubercle is large. In norma lateralis the occiput of this calva is well-curved. There is only a slight degree of lambdoid flattening and there is no plano-occipital flattening. The inion is strongly developed.

The morphological features of this calva clearly show that it belongs to an individual of the Eurafrian racial type. Regarding the affinities of Eurafrian type Buxton and Rice state: "*It appears to be a type of considerable antiquity; indeed Fleure compares it with a group of skulls from the Upper Palaeolithic, included among which are the Combe Capelle skull already mentioned.*"<sup>21</sup> In this connection it is worthwhile to note that the form of this Yümüktepe skull in norma lateralis comes close to that of Combe-Capelle skull, with the exception that the lambdoid flattening is less in the Anatolian skull than in the Upper Palaeolithic form.<sup>22</sup> In norma verticalis and norma occipitalis also the Yümüktepe skull approaches the Combe-Capelle man.<sup>23</sup> The measurements and indices of the Combe-Capelle and Yümüktepe skulls are listed in Table 6. From this table it is seen that the skull from Yümüktepe comes very close to the Combe-Capelle skull in glabello-occipital length, glabella-lambda length, maximum breadth, bregma height measured above the glabella-lambda line, bregma-lambda and lambda-opisthion arcs, cranial index, the calvarial index, expressing the bregma height above the glabella-lambda line as a percentage of glabella-lambda length and in sagittal parieto-occipital index. It differs from the Combe-Capelle skull in having a slightly smaller glabella-inion length, slightly narrower minimum frontal diameter and a somewhat larger calvarial height measured

<sup>21</sup> Buxton and Rice, 1931, pp. 69-70.

<sup>22</sup> Compare figs. 9 and 10 with Klaatsch and Hauser, 1910, pl. XXIX, fig. 1, and Beilage 1, figs. 1 and 2. Regarding the similarity of the contour of the skull of Eurafrian type from Kish, in norma lateralis, with that of Combe-Capelle man, Buxton and Rice (1931, p. 69) state: "*The general contour of this type of Kish skull is strongly reminiscent of the calvarium of the Combe Capelle skull, except that the Kish examples are much smaller.*"

<sup>23</sup> Compare figs. 8 and 12 with Klaatsch and Hauser, 1910, pl. XXX, figs. 2 and 3.



above the glabella-inion line. In consequence of these in the Anatolian skull the calvarial index expressing the height above the glabella-inion line as a percentage of the glabella-inion length is higher and the fronto-parietal index is slightly smaller than in the Combe-Capelle skull. The morphological as well as metric comparison between the Combe-Capelle skull of Upper Palaeolithic Age and the Yümüktepe skull of Chalcolithic date clearly shows that the rugged and primitive Eurafrican type, as already pointed out by Fleure<sup>24</sup> and Buxton and Rice<sup>25</sup> is a modified descendant of the Upper Palaeolithic Combe-Capelle type.

#### THE MANDIBLE FOUND AT YÜMÜKTEPE

Among the material from Yümüktepe there is an isolated mandible (fig. 13) carrying the Roman numeral (XIX) and the area number (221). According to these markings this mandible should belong to level XIX-XVIII. But as there is no skeleton from these levels listed by Garstang<sup>26</sup> to which this mandible could belong and as no isolated mandibles from these levels are mentioned by Garstang,<sup>27</sup> the level in which this mandible may have been found is uncertain.

In the mandible the right condyle is broken and missing. In this mandible the right and left first premolars, the right second premolar, the right first molar, the right and left second molars and the left third molar are preserved. All the other teeth have been lost after death. As all the permanent teeth had erupted and had gone through a moderate degree of wear, there is no doubt that this mandible belongs to an adult individual. The morphology of the mandible, described below, shows that a male individual is being dealt with here.

The measurements of the mandible are listed in Table 7. The index of ascending ramus of this mandible approaches those of the Europeans and Chinese among the recent races listed by Martin.<sup>28</sup> The corpus mandibulae of this mandible is both thicker

<sup>24</sup> Cited by Buxton and Rice, 1931, pp. 69-70.

<sup>25</sup> Buxton and Rice, 1931, pp. 69-70.

<sup>26</sup> Garstang, 1953, pp. 110-111.

<sup>27</sup> Ibid.

<sup>28</sup> Martin, 1928, p. 983. According to Martin (1928, p. 983) the average index of ascending ramus of Europeans is 49.1 and that of Chinese 50.4.

and higher than the averages of recent races listed by Martin, with also a somewhat higher height-thickness index.<sup>29</sup>

In *norma lateralis* the chin projection is positive and strong. The genial tubercles are well developed. There is no torus mandibularis. The mylohyoid line is strongly developed. The sides of the gonial angles are strongly everted. On both sides the mental foramen is single and is located under the second premolar. The place of attachment of the masseter muscle is well defined. The area of attachment of the internal pterygoid muscle is well marked. The digastric fossa shows a moderate development. The measurements and indices of the teeth of this mandible are listed in Table 8. In size the preserved teeth of this mandible are slightly larger than those of the individual from level XIX (Table 3), but its premolars are smaller than the burnt premolars listed in table 4. As for the morphology of the teeth, the first lower molar possesses five cusps. The hypoconulid (mesoconid) of this tooth is well developed. The first lower molar shows a modified form of *Dryopithecus* pattern. On the other hand, both the second and third lower molars possess only four cusps. In both the second and third lower molars the hypoconulid has completely disappeared. These teeth show Milo Hellman's plus pattern.<sup>30</sup>

Among all the teeth preserved, only the right first lower molar is carious, the carie being on the back of the chewing surface. In the left first lower premolar, there is a defect in enamel on the tip portion of the buccal surface, which would probably be the site of a future carie.

#### THE SUCCESSION OF CRANIAL TYPES AT YÜMÜKTEPE

The account given above shows that the skulls from the Chalcolithic period of Yümüktepe are all dolichocephalic and that among these dolichocephalic crania there are two types, viz., the Eurafrikan and Mediterranean racial types. It is also evident that at Yümüktepe the more primitive and the more rugged Eurafrikan type preceded the Mediterranean type. At this site the Eurafrikan type is present in levels XXIV-XXIII and XIX-XVIII, while the

<sup>29</sup> Martin, 1928, p. 979.

<sup>30</sup> See Hellman, 1928.



skull representing the Mediterranean racial type belongs to Level XIX.

This sequence of cranial types at Yümüktepe is the opposite of that observed at Tell Al-Judaïdah in the plain of Amouq. Regarding the succession of cranial types at Amouq region Krogman states: "*The longheads precede the roundheads; Mediterraneans are in advance of Euraficans...*"<sup>31</sup> In view of this difference in the succession of cranial types at Yümüktepe and Amouq, it may be asked which one of the Eurafican and Mediterranean racial types preceded the other in the history of Anatolia. The priority of the Mediterranean racial type at Amouq is based upon a not yet fully described single skull from phase C of period XIV at Tell Al-Judaïdah.<sup>32</sup> Regarding this skull Krogman states: "...*although an unrestored female skull from Phase B-C (5th millenium B.C.) is almost certainly Mediterranean in type.*"<sup>33</sup> Phase C of period XIV at Tell Al-Judaïdah is described by R. J. Braidwood and L. Braidwood as follows: "*Amouq phase C is defined as the assemblage in which clear traces of the impact of the Halafian painted pottery style are evidenced. It is important to make clear that the indigenous ceramic still persisted; Halafian painted sherds (of clays which on microscopic analysis proved to be non-Amouqian) were restricted to ca. 5 per cent of the total sherd bulk. As the phase proceeded, local painted imitations of the Halaf ware grew in favor and some Halaf profiles were even copied in the dark-faced burnished product.*"<sup>34</sup> Thus the earliest skull of Mediterranean racial type at Tell Al-Judaïdah is roughly contemporaneous with the skulls of Mediterranean and Eurafican racial types from Levels XIX and XIX-XVIII of Yümüktepe which belong to the earlier phases of the Middle Chal-

<sup>31</sup> Krogman, 1949, p. 465.

<sup>32</sup> This is skull XS 20 from Phase C of Level XIV of Tell Al-Judaïdah (see Krogman, 1949, p. 414). There is also the skull of an infant of about 3 1/2 years of age from the earlier Phase B of Level XIV at Tell Al-Judaïdah (Krogman, 1949, p. 414). For the skull of this infant (skull XS21), which is not yet described, Krogman (1949, p. 414) merely states: "*Infant, ca. 3 1/2 years old. Phase B. Skull and mandible. Restoration not attempted.*"

<sup>33</sup> Krogman, 1949, p. 420.

<sup>34</sup> R. J. Braidwood and L. Braidwood, 1953, p. 291. Krogman (1949, table 1) described phase C at Tell Al-Judaïdah as follows: "*Developed primitive and true Halaf affinities.*"

colithic or Halafian period (Levels XIX-XVII) at Mersin, but is later in date than the single skull of Eurafrian type from Level XXIV-XXIII of Yümüktepe.<sup>35</sup> Thus according to the available data, the Eurafrian type appears earlier than the Mediterranean racial type in this region.

In short, the data in hand indicates that the Eurafrian racial type preceded the Mediterranean racial type in Anatolia, in at least southern Anatolia. However, it must be kept in mind that the priority of the Eurafrian type over the Mediterranean type, is still

<sup>35</sup> Regarding the correlation of phases A-C at Amouq with the levels of Yümüktepe R. J. and L. Braidwood (1953, p. 293) make the following statement: "In our opinion, based in part on observations on the site during a visit to it in 1951, and in part on the sherds in the British School at Ankara collections, Mersin levels XIX-XXI probably correspond most closely to Amouq phase C, Mersin levels XXII-XXVI to Amouq phase B, and the sherds (which below level XXVI are marked by meter level alone) from the 1.5 m. wide trench 'A' down to 1.5 m. below water level probably correspond most closely to Amouq phase A." According to this conclusion also the skull from Level XXIV-XXIII of Yümüktepe is older in date than the skull from phase C of Tell Al-Judaidah.

As for the other early Chalcolithic skulls from this region, it may be noted that the skull from level XXIV-XXIII of Yümüktepe is earlier in date than the skulls of Eurafrian racial type from Level IX of Şeyh Höyük which, as they belong to Halafian period, in a general way correspond to the Middle Chalcolithic period (Levels XIX-XVII) at Mersin (see Şenyürek and Tunakan, 1951, pp. 431 and 439). The Early Cemetery at Gözlükule (Tarsus), which has yielded the crania of several children, is described by Ehrich (1940, p. 91) as follows: "At the present time it is not safe to assign a date to these graves, for the pottery vessels found in the jar burials have no good parallels in the strata so far excavated in Section A. They are probably earlier than 3000 B.C. and may well be associated with the Chalcolithic painted wares of the Northern al-'Obeid type, which apparently extended into the Cilician area." Regarding this Early Cemetery at Tarsus Goldman, in a later note published in the section of "archaeological news" of the American Journal of Archaeology, states (Goldman, 1949, pp. 48-49): "There were three phases of the Chalcolithic Period, which was represented by a deposit 3 1/2 meters in depth. a) The late phase extended from 27 to 29 meters. Black and red polished sherds were rare, and the chaff-tempered wares amounted to almost one hundred per cent of the bulk. Light slipped jars and bowls, both thin- and thick-walled, were the prevailing shapes, and the fabric was in great part orange colored. The finer wares had carinated profiles. There are some jars and pitchers with vertical red stripes (pl. XIV, D), but paint is on the whole rarely used. Only coarser vessels now are made of the gritty clay. To this phase belong the early graves found in 1937 when the field was tested before establishing a dump." From the information in hand, it would appear that the skulls from the Early Cemetery at Gözlükule are considerably later in date than the skull from Level XXIV-XXIII of Yümüktepe.



based upon a single skull. For this reason the conclusion reached above will perforce remain only as a tentative one until more and earlier skulls are unearthed.

As is well known some writers <sup>36</sup> had formerly supposed that the earlier inhabitants of Anatolia were roundheaded. Among these writers, Kansu, in his study of the skulls of Seljuk Turks, had even gone so far as to state: "*The Oghuz-Seljuk Turks have not completely changed the racial physiognomy of Anatolia as has been claimed. For, from the study of anthropological and archaeological documents it is understood that this country, all the way from Eastern Anatolia to the Aegean shores, had been occupied since Protohistoric times by human elements, the majority of which were Alpine, that is Proto-Turks.*"<sup>37</sup> Then Krogman, the eminent American Palaeoanthropologist and Physical Anthropologist, in his excellent study of the skulls from Alişar Höyük clearly showed that at Alişar, which is in central Anatolia, the dolichocephals of Mediterranean racial type had antedated the brachycephals.<sup>38</sup> Afterwards, in a study based upon a larger series of crania coming from various parts of Anatolia, published in 1941, I was able to demonstrate that the vast majority of the Chalcolithic and Copper Age inhabitants of Anatolia were dolichocephals of Eurafian and Mediterranean racial types and that the brachycephals, which were of the Alpine type, were relatively rare in these periods. <sup>39</sup>

<sup>36</sup> von Luschan, 1911; Fischer, 1923; Kansu, 1943, pp. 443-444 and 456.

<sup>47</sup> Kansu, 1943, p. 456. This passage from the article of Kansu has been translated into English by me. The Turkish text of Kansu is as follows: "*Oğuz-Selçuk Türkleri Anadolu'yu istilâ etmekle, iddia edildiği gibi, Anadolu'nun ırkı simasını tamamen değiştirmiş değildirler. Çünkü Selçuk Türkleri Anadolu'ya geldikleri vakit bu toprakların şarkî Anadolu'dan ta Ege kıyularına kadar büyük bir ekseriyeti Alpli yani Proto-Türk olan beşer unsurları tarafından Protostüvar'danberi meskûn olduğu, bir taraftan antropolojik, diğer taraftan arkeolojik vesikaların tetkiki ile anlaşılmaktadır.*"

<sup>38</sup> Krogman, 1937. See also Coon, 1939, pp. 136-137 and Vallois, 1939, pp. 181 and 191-192.

It may also be recorded here that in his first report published in 1933, Krogman had already indicated that at Alişar Höyük the dolichocephals had preceded the brachycephals (Krogman, 1933, p. 131).

<sup>39</sup> Şenyürek, 1941. This conclusion I reached in 1941 has been accepted and followed by Kansu and Kansu and Tunakan in their later studies (see Kansu and Tunakan, 1945, pp. 414-415; Kansu and Tunakan, 1946, pp. 542, 546, 547, 549 and 553; Kansu, 1948, p. 312).

For the present state of our knowledge on the cranial types among the early inhabitants of Anatolia see Şenyürek, 1951c.

This new study made on the Chalcolithic skulls from Yümüktepe has further confirmed this conclusion that the earlier inhabitants of Anatolia were predominantly dolichocephalic and that the brachycephals came in later, probably as invaders.<sup>40</sup>

#### SUMMARY AND CONCLUSION

In summary it can be stated that the Chalcolithic skulls from Yümüktepe are all dolichocephalic and that among these dolichocephalic skulls there are two cranial types, viz., the Euraffrican and the Mediterranean racial types. At this site the more primitive and rugged Euraffrican type appears earlier than the Mediterranean type.<sup>41</sup>

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<sup>40</sup> Şenyürek, 1941, pp. 222, 227, 240 and 245; Şenyürek, 1949, pp. 299 and 304; Şenyürek, 1951c, pp. 602, 614 and 615; Şenyürek, 1952c, p. 336.

Dr. Tahsin Özgüç, in his study on the ancient burial customs in Anatolia makes the following statement (Özgüç, 1948, p. 150): *Man würde dann sehr weitgehende Vergleichsmöglichkeiten bekommen, wenn man die anthropologischen Forschungsergebnisse von Ş.A. Kansu, der drei Rassen, nämlich die Mittelmeer-, die Eurafrikanische und die Alpine, festgestellt hat, mit dem archäologischen Material zusammenstellte.*" However, from the account given in this report it is clear that in the statement quoted Dr. Tahsin Özgüç has unfortunately confused the contributions made by different authors on the palaeoanthropology of Anatolia.

For the history of contributions made on the palaeoanthropology of Anatolia see: Şenyürek, 1949, pp. 303-304; Şenyürek, 1951b, pp. 52-55; Şenyürek, 1951c, pp. 602-605; Şenyürek, 1952c, pp. 336-337.

<sup>41</sup> It should be noted that while this paper was still in the press a review by Professor H. V. Vallois appeared (L'Anthropologie, Vol. 58, Nos. 1-2, 1954, pp. 128-130) on the skeletons from Şeyh Höyük, studied by me and Tunakan, and two other papers of mine. In reviewing the Euraffrican type at Şeyh Höyük, Vallois (1954, P. 129) makes the following statement: *"Tous ces crânes, dans l'ensemble, peuvent être rangés dans le type racial eurafricain, confirmant par là une fois de plus l'ancienneté de ce type en Asie Mineure."*



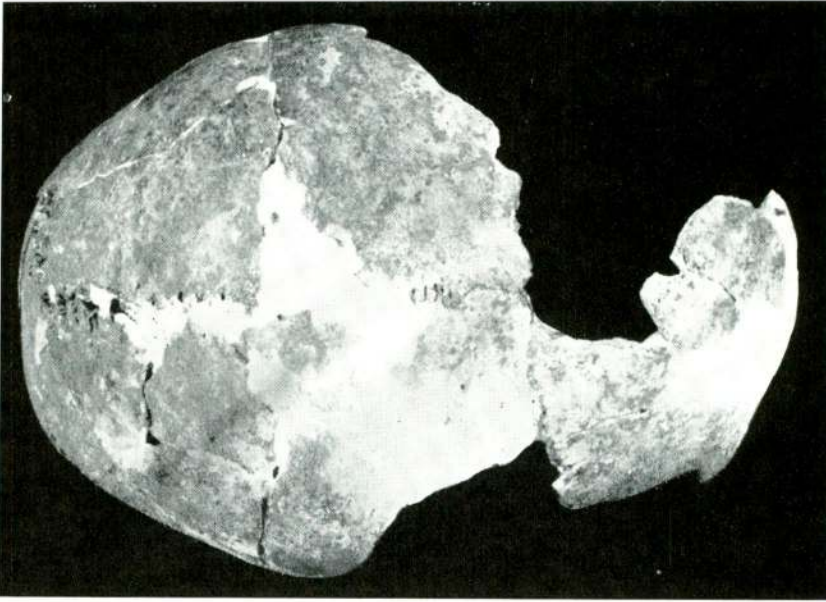


Fig. 1



Fig. 2

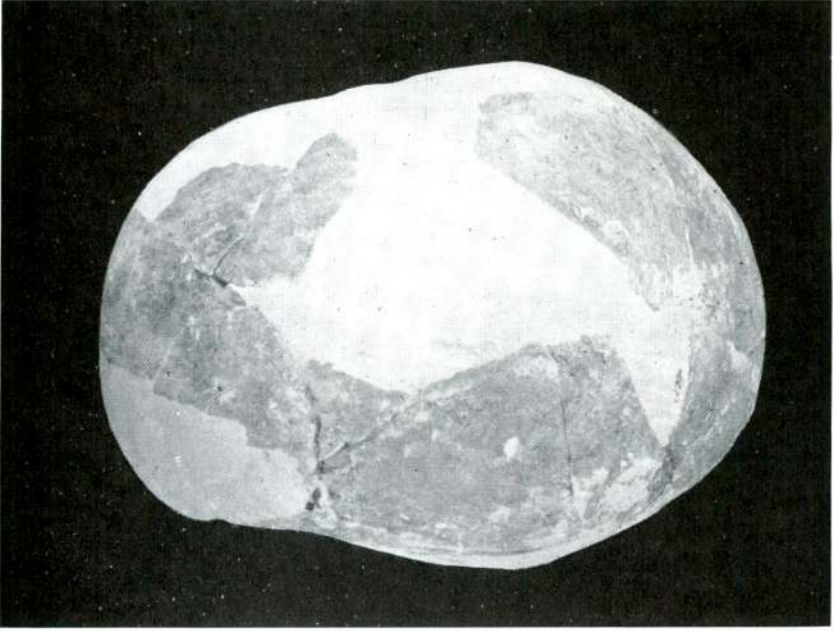


Fig. 3

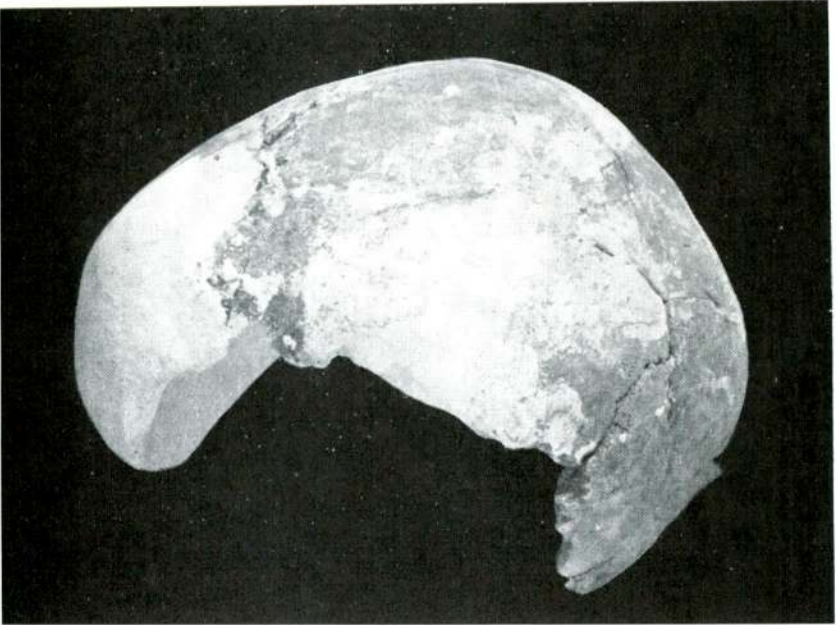


Fig. 4



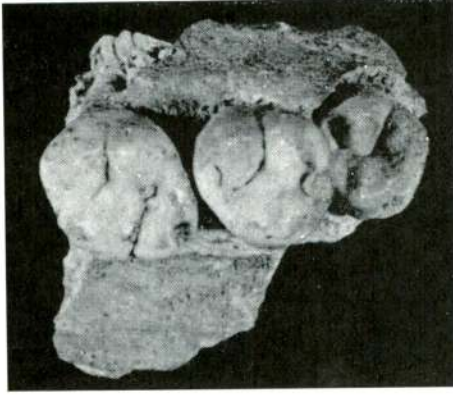


Fig. 5

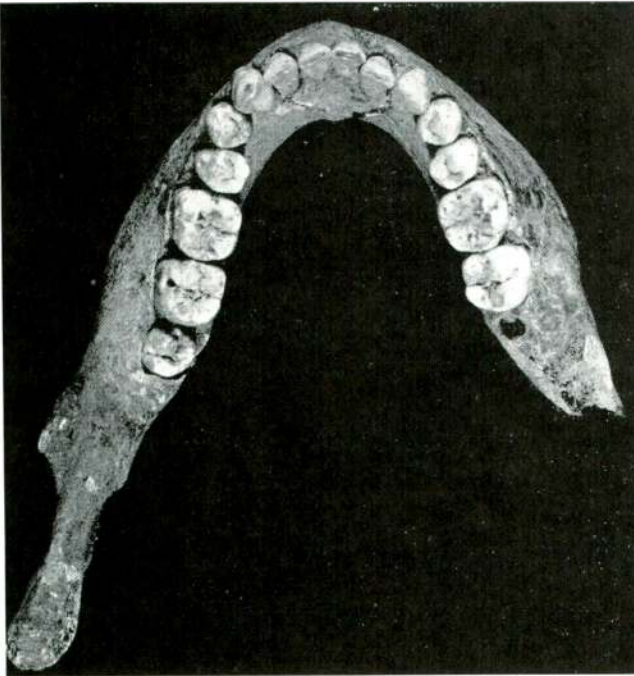


Fig. 6



Fig. 7

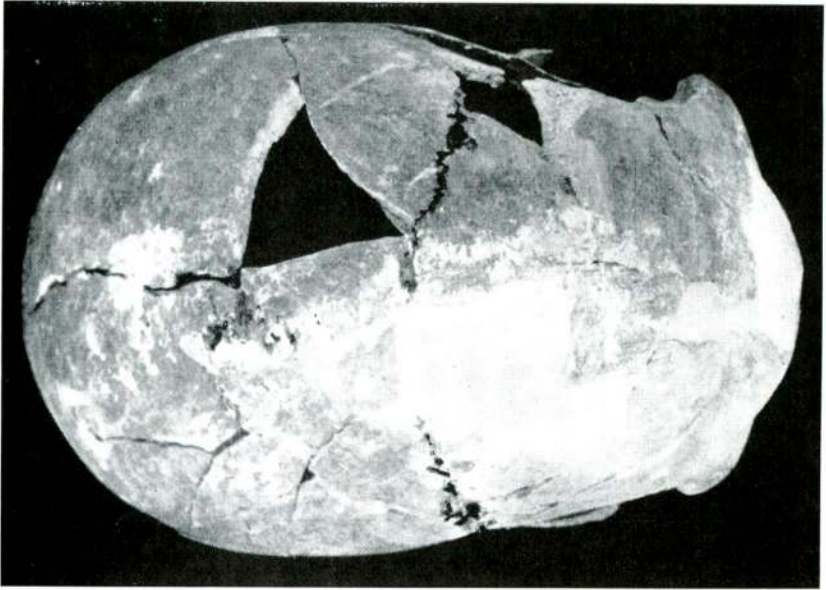


Fig. 8

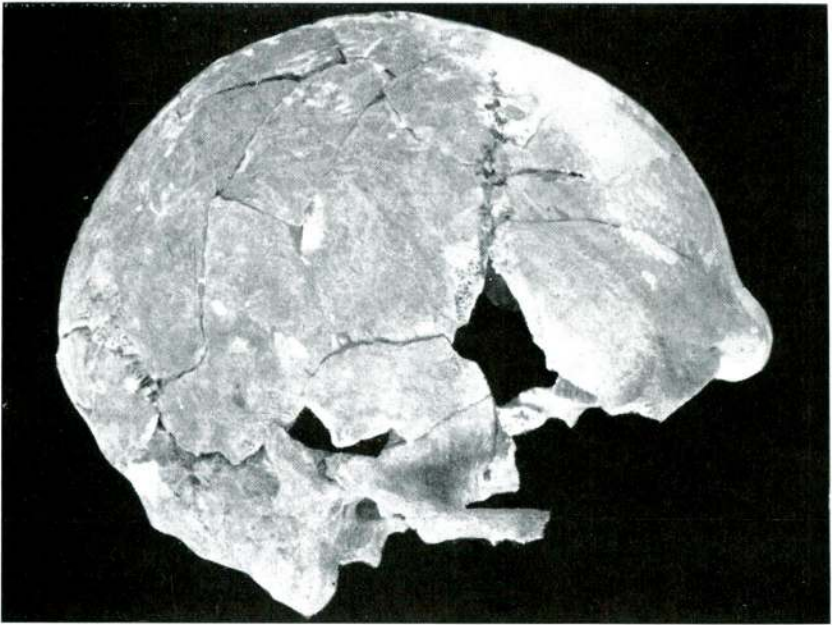


Fig. 9



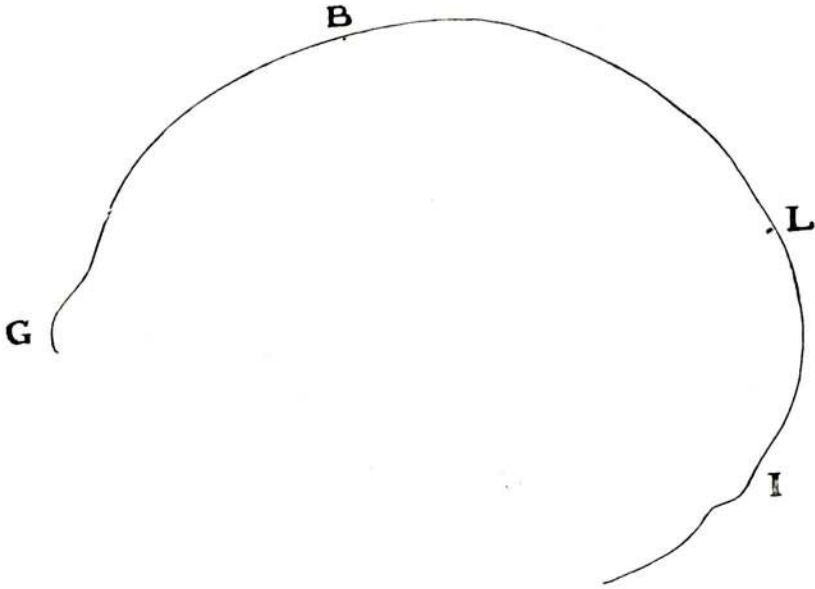


Fig. 10

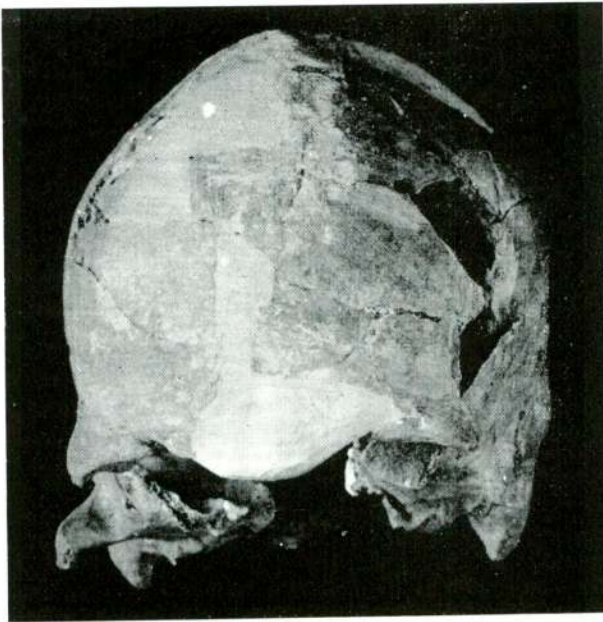


Fig. 11

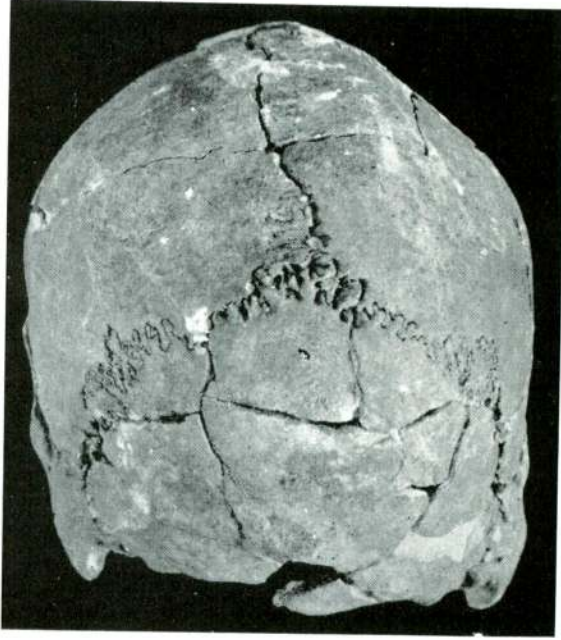


Fig. 12

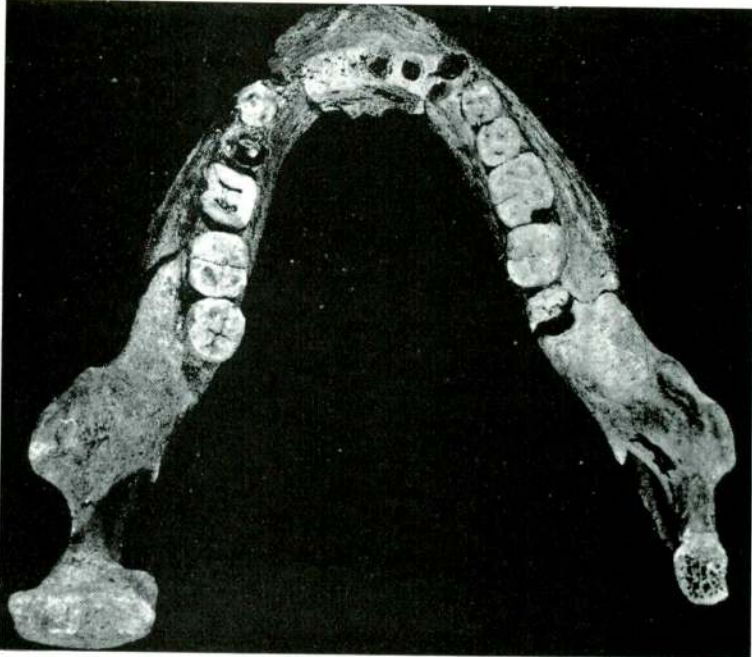


Fig. 13



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### EXPLANATION OF THE FIGURES

- Fig. 1 — Yümüktepe. The skull from Level XXIV-XXXIII in norma verticalis.  
 Fig. 2 — Yümüktepe. The skull from Level XXIV-XXIII in norma lateralis.  
 Fig. 3 — Yümüktepe. The skull from Level XIX in norma verticalis.  
 Fig. 4 — Yümüktepe. The skull from Level XIX in norma lateralis.  
 Fig. 5 — Yümüktepe. The upper right molars belonging to the skull from Level XIX.  
 Fig. 6 — Yümüktepe. The mandible of the skull from Level XIX in norma verticalis.  
 Fig. 7 — Yümüktepe. The burnt mandibular fragment and the teeth found at Level XIX (the root of the right canine and the first and second premolars).  
 Fig. 8 — Yümüktepe. The skull from Level XIX-XVIII in norma verticalis.  
 Fig. 9 — Yümüktepe. The skull from Level XIX-XVIII in norma lateralis.  
 Fig. 10 — Yümüktepe. The sagittal contour of the skull from Level XIX-XVIII (G=glabella, B=bregma, L=lambda, I=inion).  
 Fig. 11 — Yümüktepe. The skull from Level XIX-XVIII in norma frontalis.  
 Fig. 12 — Yümüktepe. The skull from Level XIX-XVIII in norma occipitalis.  
 Fig. 13 — The mandible found at Yümüktepe in norma verticalis.

TABLE 1

Measurements of the Mandible of the Individual from Level XIX<sup>1</sup>

Minimum breadth of ascending ramus	34.00
Height of corpus (at foramen mentale)	28.50 <sup>2</sup>
Thickness of corpus (at foramen mentale)	13.70 <sup>2</sup>
Bimental width (distance between the two foramina mentalia)	45.50
Symphysis length	31.00
Height-thickness index of the corpus	48.07

<sup>1</sup> In this study all cranial, mandibular and dental measurements are given in millimeters.

<sup>2</sup> Average of two sides.

TABLE 2

Measurements of the Teeth of the Individual from Level XIX

Maxillary Teeth	Length	Breadth	Height (Crown)	Robustness Value <sup>1</sup>	Crown Index <sup>2</sup>
M <sup>1</sup>	10.00	10.90	6.90 +	109.00	109.00
M <sup>2</sup>	9.60	10.50	7.20	100.80	109.37

<sup>1</sup> Robustness Value = Length × Breadth.

<sup>2</sup> Crown Index =  $\frac{\text{Breadth} \times 100}{\text{Length}}$ .

TABLE 3  
Measurements of the Teeth of the Individual from Level XIX

Mandibular Teeth	Length	Breadth	Trigonid Breadth	Talonid Breadth	Height (Crown)	Robustness Value	Crown Index	Trigonid-Talonid Index <sup>1</sup>
I <sub>1</sub>	5.00	5.80	—	—	—	29.00	116.00	—
I <sub>2</sub>	5.40	6.30	—	—	—	34.02	116.66	—
C <sub>1</sub>	6.30	7.70	—	—	—	58.51	122.22	—
P <sub>3</sub>	6.40	7.30	—	—	8.30	46.78	114.06	—
P <sub>4</sub>	6.60	8.00	—	—	7.80	52.80	121.21	—
M <sub>1</sub>	10.20	10.20	10.20	10.10	—	104.04	100.00	99.01
M <sub>2</sub>	9.60	9.90	9.90	9.50	7.60 +	95.04	103.12	95.95

$$^1 \text{Trigonid} \div \text{Talonid Index} = \frac{\text{Talonid Breadth} \times 100}{\text{Trigonid Breadth}}$$



TABLE 4  
Measurements of the Burnt Teeth from Level XIX

		Length	Breadth	Robustness Value	Crown Index
Maxillary teeth	M <sup>2</sup>	9.30	11.60	107.88	124.73
Mandibular teeth	P <sub>3</sub>	6.70	7.90	52.93	117.91
	P <sub>4</sub>	7.00	8.80	61.60	125.71

TABLE 5  
Measurements of the Calva of the Individual from Level XIX-XVIII

Glabello - occipital length	197.00
Maximum breadth	131.00
Minimum frontal diameter	94.00
Porion - bregma height	L=114.00 R=125.00
Mean thickness of parietal	5.10
Horizontal circumference	520.00
Transverse arc	305.00
Cranial index	66.49
Po-b-length index	57.86—63.45
Po-b-breadth index	87.02—95.41
Fronto-parietal index	71.75

TABLE 6

Comparison of the Measurements and Indices of Combe-Capelle Skull  
with those of the Skull from Level XIX-XVIII of Yümüktepe

	Combe-Capelle Skull <sup>1</sup>	The Skull from Level XIX-XVIII of Yümüktepe
Glabello-occipital length	198.00	197.00
Glabella-inion length	191.00	188.00
Glabella-lambda length	192.00	191.00
Maximum breadth	130.00	131.00
Minimum frontal diameter	97.00 <sup>2</sup>	94.00
Calvarial height I (maximum height above glabella-inion line)	104.00	109.00
Calvarial height II (height of bregma above glabella-lambda line)	68.00	67.00
Bregma-lambda arc	133.00	132.00
Lambda-opisthion arc	125.00	125.00
Cranial index	65.65	66.49
Calvarial height-length index $\left( \frac{\text{calvarial height I} \times 100}{\text{glabella-inion length}} \right)$	54.45	57.97
Calvarial height-length index $\left( \frac{\text{calvarial height II} \times 100}{\text{glabella-lambda length}} \right)$	35.41	35.07
Fronto-parietal index $\left( \frac{\text{min. frontal diameter} \times 100}{\text{max. breadth}} \right)$	74.61 <sup>3</sup>	71.75
Sagittal parieto-occipital index $\left( \frac{\text{lambda-opisthion arc} \times 100}{\text{bregma-lambda arc}} \right)$	94.00	94.69

<sup>1</sup> The bregma-lambda arc, the lambda-opisthion arc and the sagittal parieto-occipital index of the Combe-Capelle skull are taken from Martin who cites these figures after Saller (Martin, 1928, p. 824). All the other measurements of Combe-Capelle skull are after Klaatsch, the original describer of this fossil find (Klaatsch and Hauser, 1910).

<sup>2</sup> This is given by Klaatsch as the postorbital width (Klaatsch and Hauser, 1910, p. 304).

<sup>3</sup> Calculated from the figures given by Klaatsch (Klaatsch and Hauser, 1910). According to Saller, cited by Martin, this index of Combe-Capelle skull is 73.00 (Martin, 1928, p. 824).

TABLE 7

Measurements of the Mandible Found at Yümüktepe

Condylö-symphyseal length	106.00?
Bigonial width	103.00
Height of ascending ramus (from gonion to highest point of condyle)	63.00
Height of ascending ramus (projected)	62.00
Minimum breadth of ascending ramus	32.00
Height of corpus (at foramen mentale)	L=34.00
Thickness of corpus (at foramen mentale)	L=15.00
Bimental width (distance between the two foramina mentalia)	49.00
Index of ascending ramus	50.79
Height-thickness index of the corpus	44.11

TABLE 8

Measurements of the Teeth of the Mandible Found at Yümüktepe

Mandibular Teeth	Length	Breadth	Trigonid Breadth	Talonid Breadth	Robustness Value	Crown Index	Trigonid-Talonid Index
P <sub>3</sub>	6.60	7.10	—	—	46.86	107.57	—
P <sub>4</sub>	6.80	7.90	—	—	53.72	116.17	—
M <sub>1</sub>	10.70	10.20	10.20	10.20	109.14	95.32	100.00
M <sub>2</sub>	10.40	9.60	9.60	9.50	99.84	92.30	98.95
M <sub>3</sub>	10.30	9.50	9.50	9.30	97.85	92.23	97.89



