HUMAN FOSSIL REMAINS IN BELDIBI AND BELBAŞI ROCK SHELTERS ON THE MEDİTERRANEAN COAST OF ANATOLIA

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In the excavations undertaken in the Pleistocene beds in Anatolia, a few human fossil remains have emerged together with Palaeolithic cultures. In the summer field researches which I have undertaken in the south of Anatolia in one cave and three rock shelters, sites occupied by Levalloiso-Mousterian and Upper Palaeolithic man have been established. It is to be hoped that other areas in Turkey, e.g. the Gök Irmak valley, will also yield fossil evidence of prehistoric man.[1] Previously the only human fossil remains which had come to light were four molars found in the Levalloiso-Mousterian layers in the Mağracık caves near Antakya[2] (old Antioch) in the summer season of 1956. During the excavation of the first cave, which I had discovered in 1954, we found in the lower part of the Middle Palaeolithic (Levalloiso-Mousterian cultures of the Near East) two upper permanent molars and one lower permanent molar belonging to fossil man at a depth of 220 cms. in the stratigraphy. In Kara In cave near Antalya (old

1 Bostancı, 1952, pp. 137–142.

2 The molars which were found in the stratigraphy in the Mağracık cave 1 at the foot of Musadağ on the right side of the Asi delta are all belonging to the Levalloiso-Mousterian period. Together with the molars we found mammals such as cave bear, cave lion, wild boar, etc. (Şenyürek and Bostancı 1959. p. 82) The first molar was discovered in 1956 May when 1 made the first sounding. It came to light at the bottom of the cave deposits. The age of these levels is Wurm 1. In June of the same year Professor Şenyürek, Chairman of the Division of Palaeoanthropology in the University of Ankara, and 1 began to excavate together. During this excavation we found three more molars in the stratigraphy all belonging to the Levalloiso-Mousterian levels. For this sounding see: Şenyürek and Bostancı, 1956, pp. 81–83; Further excavations also see Şenyürek and Bostancı, 1958, pp. 147–169; Şenyürek and Bostancı, 1958. pp. 171–210; Also see Coon, 1963. pp. 561, 562.

Adalia) two teeth were found in a Mousterian deposit[3] and were identified by Professor Dr. Muzaffer Şenyürek as belonging to Neanderthal man.[4]

In this article only the human fossil remains which have emerged from the Beldibi and Belbaşı rock shelters near Antalya on the Mediterranean coast of Anatolia will be dealt with.[5] Beldibi rock shelter is a prehistoric site which contains rock paintings and engravings together with artistic objects in the stratigraphy and in this is unique both in Turkey and the Middle East generally[6]. I have also discovered another rock shelter called Belbaşı not far from Beldibi but about 300 metres above the present sea level higher up in the mountains, containing Mesolithic and late Upper Palaeolithic industry. Both rock shelters yielded some bones belonging to fossil Homo Sapiens.

During the first excavation of the Beldibi rock shelter in 1959, I found in the Mesolithic and Upper Palaeolithic layers some small fragments of human skull. Those from the Mesolithic layers showed traces of having been burned. In the Upper Palaeolithic layers the skull fragments from the level containing backed blades and Gravette points were more fossilised. In 1960 when the sounding was enlarged, there emerged from the same level as the nose-scrapers two pieces of human femur, one right and one left. Unfortunately the distal and proximal parts of both these pieces are missing, but I believe they belong to a young female. On both these pieces the linea aspera is moderately developed, which suggests that they form part of the middle of the shaft of the femur. As is known, the linea aspera is strong in modern man but weak in prehistoric man, a fact connected with the upright posture. According to the measurements taken at the centre of the shaft on the left femur, antero-posterior diameter is 27 mm. and transverse diameter is 23.5 mm. From these measurements the plaster index obtained is 114.8. The plaster index in Neanderthal man is 99.0;

3 One of the most important prehistoric sites is Kara In near Antalya not far from Yağça village in the mountains about 600 metres above sea level 25 kms. inland on the Mediterranean coast of Anatolia. It is being excavated by Prof. Dr. Kılıç Kökten. According to Kökten Kara In has a stratigraphy containing Lower Palaeolithic up to Mesolithic, Neolithic, protohistorical and classical periods. See Kökten, 1955. pp. 271–293; Plates I–XI. Kansu, 1947. pp. 227–232.

4 Şenyürek, 1949. pp. 833–836.

5 Bostancı, 1959. pp. 129–178.
Bostancı, 1962. pp. 233–292.

6 Bostancı, 1959. pp. 132, 140, 141. Plate I, II, III. Plate XV.

7 Bostancı, 1962. pp. 252–292. Plates I–XIV.

in Spy fossil man it is 100.5 and in modern man and various primitive groups the index varies between 100 and 131.8 [8]. For the Beldibi fossil man the index is the same as that given by Martin and Saller (1959) for Malayans, Melanesians and Salado-Indians[9]. These indices are respectively 114.7, 114,7 and 115.8. The index in Pithecanthropus Erectus quoted by Martin and Saller is 109.1 and in Neanderthals 100.5. According to McCown and Keith the plaster index in Skhul IV is 127.6 on the right and 128.6 on the left and in Skhul V 142.5 and 137.0 respectively. In Skhul VI it is 118.5 on the right femur and 119.2 on the left. The same index in Skhul III is 114.5 on the left femur.[10] This again is the same as the index in the Beldibi Upper Palaeolithic fossil bones. McCown and Keith (1939) quote the plaster index for Tabun I fossil man as 91.6 on the right femur. These figures show that the plaster index is low in Neanderthal man and increases generally towards Homo Sapiens. The index for the Beldibi femur is an intermediate one.

As mentioned above, the second piece of femur, that is the right one, is smaller and is also from the shaft. For this reason it was possible to take the antero-posterior and transverse diameter measurements. These were slightly higher than on the left femur. The antero-posterior diameter is 28 mm. and transverse diameter is 24 mm. From these measurements the plaster index obtained is 116.17. This index is the same as that found in Negritos and Australian aborigines, that is, 116.0 and 116.9 respectively.[11]

From these figures it is therefore obvious that the plaster index of the femur from Beldibi is comparable to that of present-day primitive groups. The skull fragments are unfortunately too small to yield any evidence concerning the physical characteristics of the Beldibi fossil man.

The mandibula from Belbaşı Rock Shelter

In the Mesolithic layer of the Belbaşı rock shelter a human lower mandibula was found together with a typical Sauveterrian and partly Nebequian type microlithic industry.[12] This mandibula is not complete, con-

8 The plaster index of the femur in various tribes and fossil man is quite variable. The lowest plaster index according to Martin and Saller is in Homo Neanderthalensis and the highest degree of plaster index is in the Bushman 131.8. Martin and Saller, 1959. p. 1081.

9 Martin and Saller, 1959. p. 1081.

10 McCown and Keith, 1939. p. 68. Plate XVII A, Plate XVII B.

11 Martin and Saller, 1959. p. 1081.

12 Bostancı, 1962. pp. 236, 255; Rust, 1950. p. 107 Table 101. For the Sauveterrian see Coulonges 1935. pp. 1–55. Plates I–VI.

sisting of only half the left side. It belonged to an individual of about 18 years of age, probably female. This half mandibula is broken at the line of the first molar M_1. Only three permanent molars remain and the processus coronoideus has also been broken. The processus condillaris mandibulae remains, but the external side has been chipped off, and it is not possible to say whether the tuberculum sub-condilloideum had existed or not.

There is no doubt that the mandibula belonged to a young individual because the third permanent molar had erupted before death and was not worn on the cusps at all.[13] M_3 is a comparatively large tooth, the occlusal surface of which is not worn off and the grooves are very clear. It is possible to identify the number of cusps and the pattern of the tooth: there are six cusps and it shows +6 pattern.[14] M_3 is comparatively long; mesio-distal diameter is 12 mm., bucco-lingual diameter is 11 m., and the height is 6.5 mm. (tip of the protoconid and the neck of the tooth).

M_3 shows primitive characters; it is long and the six cusps are very clear. The hypoconulid is larger than the hypoconid and the tuberculum sextum entoconulid is smaller than the entoconid. The largest cusp is the protoconid, then the entoconid followed by the metaconid, hypoconulid, hypoconid and the smallest is the entoconulid. On the anterior side of the occlusal surface there is a fovea. The grooves are deep and the distal part of the molar is larger than the mesial side. The trigonid is flatter than the talonid because the hypoconulid grew backwards. M_3 is the largest molar, M_1 is next and M_2 is the smallest.[15] In this respect the order of

13 M_3 permanent molar grew more quickly than M_2 and it also grew towards and over M_2. M_2 has the lowest level between the two molars M_1 and M_3 It is a fact that M_2 erupted not very long before death. This evidence also shows that in this lower jaw M_2 and M_3 erupted before the 18th year. In the Mesolithic people of Afalan M_3 erupted very early. Aramburg, Boule, Vallois, Verneau 1934. p. 146. M_3 erupted early in part of the Mesolithic people of Teviee. Pequart, Marthe and Saint-Just, Boule, Vallois, 1937. p. 138; Şenyürek, 1955. p. 434.

14 The types of occlusal patterns in human lower molars have been described by Schuman and Brace 1954. These authors show six types of lower permanent molars, viz: +5, Y5, +4, +6, Y6, Y4. For these patterns see also Schuman and Brace, 1954. pp. 239–268. For the pattern of the lower permanent molars see also Chagula, 1960. pp. 84; Comas, 1960. pp. 381–387. Gregory and Hellman, 1926. pp. 1–128.

15 The order of size is the same as that given for fossil man by Martin and Saller, 1959. p. 1456. When they are compared with the Belbaşı molars, it is interesting to see that there are close similarities as regards the order of size both in fossil man and in primitive and modern man.

1 – La Noulette	$M_1 < M_2 < M_3 > M_1$	Largest one is M_3 and smallest one is M_1
Variant from Spy	$M_1 > M_2 < M_3 > M_1$	Smallest one is M_2

the size of the permanent molars is similar to that of Spy quoted by Martin and Saller.

The second permanent molar is on a lower level and only the buccal cusps are worn off slightly. M_2 shows +4 pattern and there are definitely four cusps, all more or less the same size. There is a small fovea on the anterior side of the molar.[16] The measurements of M_2 are length 10 mm., width 10 mm. and height 5 mm.

The first permanent molar of this individual is very much worn off on the buccal side and it is difficult to see the grooves, or to say whether the entoconulid remained or not. It is safer to say there are five cusps and it possibly shows dryopithecus pattern.[17] It seems to me that in M_1 No. 2 and No. 3 cusps are joined to each other, so it must have Y5 pattern. The measurements of this tooth are as follows: length 11.8 mm., width 10.5 mm. and height 4.5 mm. There are two wide roots parallel to each other, the length of which on both anterior and posterior sides is 13.5 mm. The other two molars are still firmly embedded in their sockets and it is not possible to measure their roots.

The order of eruption of the permanent molars in this mandibula is very clear. M_1 erupted first, then M_2 and M_3 was the last. In this Mesolithic female mandibula M_3 had erupted before she reached her 18th year.

2 –	Mauer	$M_1 < M_2 > M_3 > M_1$	Largest one is M_2 and smallest one is M_1
3 –	Ehringsdorf	$M_1 < M_2 > M_3 < M_1$	Largest one is M_2 and smallest one is M_3.
4 –	Krapina and Modern ...	$M_1 > M_2 > M_3 < M_1$	Largest one is M_1 and smallest one is M_3
5 –	Belbaşı	$M_1 > M_2 < M_3 > M_1$	Smallest one is M_2 and largest one is M_3.

In the Belbaşı mandible M_3 and M_1 are actually very close to each other in size: the difference is hardly noticeable.

16 The cruciform (+) shaped pattern is characteristic of human teeth as mentioned by Gregory, 1921. p. 127.

17 Five-cusped lower molars show dryopithecus Y5 pattern which was characteristic of the fossil anthropoid ape (Dryopithecus Genera). This pattern is an anthropoid heritage in the lower molars which is found in fossil man and mostly in primitive groups of man. See Gregory 1920, p. 684, fig. 265; p. 708, fig. 284, 285; p. 709, fig. 286. See also Weidenreich, 1937. pp. 77–96; Comas, 1960. pp. 383, 386. Heberer, 1961. pp. 257, 268, 274. Dahlberg, 1962. pp. 208, 209. The five-cusped lower molars show two variations, metaconid and hypoconid adjoin each other and are Y5, and protoconid and entoconid are adjacent. Comas, 1960. pp. 384.

Professor Şenyürek states that 'in a great majority of the Chalcolithic and Copper Age populations of Anatolia the third molars had erupted before the age of twenty which is a primitive character'.[18] On the other hand, it is known that in an important proportion of recent whites, the eruption of the third molar is retarded until the age of twenty;[19] also in the majority of modern Turks the wisdom teeth erupt after the age of twenty.[20]

The area musculi pterygoides internal shows that this individual had comparatively strong masticatory muscles. The fossa massetirica is deep and at this point the thickness of the jaw is 7 mm. The foramen mandibula is large and deep and from the outside shows a triangular shape. The sulcus mylohyoides extends to the level of the third molar.

The most interesting characteristic of the jaw can be seen in the processus condylaris mandibulae, When viewed from above, the surface of the caput mandibulae narrows in the centre, because a fovea has been formed on the posterior part of the articular surface. From the posterior side this fovea divides the head of the caput into two parts. The maximum depth of the fovea is 5 mm. and it is nearly circular, the diameters being 7 mm. and 6 mm. No doubt this individual had a variation on the usual muscle and it may be convenient to call this type of formation 'fovea caputulum mandibulae'.

I have examined all the Neolithic, Chalcolithic, Copper and Bronze Age series and also a large series belonging to Turks from the Ottoman period in our collections, but have come across only one case which had a similar formation. This occurred in both condyles. The characteristic is not seen in any of the jaws belonging to fossil man, anthropoids and monkeys which I have examined in various museum collections in Europe.[21]

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18 Şenyürek, 1956. p. 22.

19 Broca, 1875. p. 131; Bean, 1914, 1915. p. 132. Suk, 1919. pp. 369–370; Helman, 1936. pp. 750–762. Şenyürek, 1956. pp. 210, 211.

20 Şenyürek, 1956. p. 211. In addition to the examination of Chalcolithic and Copper Ages of Anatolia, Prof. Şenyürek examined 239 students in Ankara in the Dil ve Tarih-Coğrafya Fakültesi and published some of the results. He stated that "the present small series indicates that in an important part of modern Turks the wisdom teeth erupt after the age of twenty". In this study he is of the opinion that "during the last 4000 years a retardation has occurred in the eruption of the wisdom teeth in the white stock".

21 Prof. Weidenreich has studied all the mandibles Sinanthropus Pekinensis and the jaws of other fossil man and also anthropoids and lower primates as well as of modern Chinese, and he did not mention any similar formation in his excellent work published in 1936. Weidenreich, 1936. pp. 75, 76, 77.

A comparison of the Mesolithic and the modern Jaw

The lower jaw in which this similar formation occurs belonged to a female of probably 25–30 years of age from the late Ottoman period. Unfortunately the rest of the skull is not known.

When the external edges of the ramus are examined, it can be seen that in the modern jaw they are slightly concave, after forming an angle of 120° with the corpus, while in the Belbaşı jaw, the edge is oblique up to the processus condilaris, after forming an angle of 120° with the corpus. The shape of the angulus mandibulae in the Belbaşı jaw in much more rounded and is similar to the jaws of other fossil men.[22] In this jaw also there is a sulcus running between the linea obliqua and the socket of the third molar and extending internally up to the processus coroneidus. This is a most unusual character and is not present in the modern jaw. The tuberositas pterygoides in the Belbaşı jaw are more strong and cover a wide area. When these two jaws are examined from the inside, some important morphological differences can be observed. For instance, the linea mylohyoides in the Belbaşı jaw finishes at the level of 11 mm. from the socket of M_3, but in the modern jaw this is not the case, as it extends obliquely right up to the socket level. It is obvious therefore that these two individuals had wide variations in the muscle system.

In spite of these differences in the two jaws, there can, as mentioned above, be seen a close similarity in the formation of the processus articularis of the caputulum mandibulae. In the modern jaw both condyles have a small circular posterior fovea, that on the right condyle being deeper and very similar to that on the Mesolithic jaw. In the modern jaw there is a groove which divides the right condyle into two, thus forming a double-headed type rather similar to some described by Hrdlicka.[23] It should be mentioned here, however, that of these, 12 specimens including White, North American and Peruvian Indian, Eskimo and Chinese have a more or less complete division of the condyle into two by a deep groove or fossa, while out of 11 others showing a tendency towards this formation three, one a Kodiak Islander (male adult), the second a Chinese (also a male adult) and the third a Sioux (female adult), show the closest similarity

22 McCown and Keith have illustrated the profiles of all the lower jaws from Mount Carmel fossil man and compared them with the mandibulae of Krapina and Heidelberg man. The profile of the Belbaşı Mesolithic mandibula is similar to both these and also to Tabun I and II and Skhul IV. McCown and Keith, 1937. Fig. 145, 146, 162.

23 Hrdlicka, 1941. pp. 75, Fig. 2–9, Plates 1–3.

to the two specimens now being examined.[24] Hrdlicka also states that apart from one adult male gorilla, in which he observed a slight tendency to this formation, he had not met with it in any other primates or mammals.[25] In the Belbaşı jaw the articular surface from above appears flat with curved edges, while in the modern jaw the shape is more similar to some described as 'hour-glass' by Hrdlicka.[26] I should mention here that neither the Belbaşı jaw not the modern jaw showed any indication of an arthritic condition, as did so many of Hrdlicka's.

Hrdlicka does not seem to think that this anomaly has any phylogenetical significance and suggests that some mechanical interference with the ossification of the part concerned may be the only explanation.[27] All the cases mentioned by him are from modern groups and the one from the Mesolithic period at Belbaşı is the earliest I know of up to now. From my examination of relevant material I am of the opinion that phylogenetically it may be a new form.

Apart from this formation, the anatomical and morphological characters of the Ottoman period jaw are normal. On the right, molars M_2 and M_3 are in place, and on the left, molars M_1, M_2 and M_3. - the other teeth have been lost after death. Only M_1 on the left is slightly worn. The order of eruption was first M_1, followed by M_2 and then M_3. On the left M_1 and M_2 have four cusps and show + 4 pattern. On the right M_2 also shows + 4 pattern and there is an obvious small fovea anterior to it. On both M_3 molars there are five cusps, three of which are on the external side. This characteristic can also be seen on the Belbaşı Mesolithic jaw, but in the latter M_3 has six cusps.

When the fragment of lower left jaw from Belbaşı is compared with the modern jaw, important differences can be observed. First, the height of the corpus caputulum mandibulae of the Belbaşı specimen is 70 mm. while that of the modern jaw is only 53 mm. when both are placed on a flat surface. In the Belbaşı jaw the narrowest part of the ramus mandibulae is 35 mm., while in the other it is 31 mm. The height of the corpus mandibulae between M_2 and M_3 in the Belbaşı jaw is 34 mm. as compared with 24 mm. in the modern one and between M_1 and M_2 it is 33 mm. and 24.5 mm. respectively. Although the thickness of the body of the mandibula

24 Hrdlicka, 1941. pp. 77–78.
25 Hrdlicka, 1941. p. 75.
26 Hrdlicka, 1941. p. 79.
27 Hrdlicka, 1941. p. 76.

is less in the Belbaşı jaw, the other one shows greater variation in the morphological characters.

I measured the left caputulum mandibulae in both jaws and have taken the diameter between the anterior and posterior margins at its maximum as the width and the diameter from the mesial to the distal sides as the length. These measurements are as follows: in the Belbaşı jaw width 10.5 mm., length 21 mm.; and in the modern jaw width 9.5 mm. and 20.5 mm. respectively. In the right condyle in the latter case the measurements are 9 mm. and 20 mm.

It seems to me that the fovea caputulum mandibulae in both cases has the same origin, whatever purpose it may have served, but morphologically they are not identical. In the modern jaw, this fovea contributes to the division of the condyle into two, while in the Belbaşı specimen the fovea is situated rather lower down on the posterior side of the condyle and the articular surface is not divided into two.

After a consideration of Hrdlicka's examples and of the Belbası and Ottoman period jaw, I am of the opinion that in general this fovea takes two main forms and that in the two specimens under discussion there is an example of each type. In Hrdlicka's specimens there seem to be a number of individual variations and, as explained above, these have been taken from several different racial groups. This, together with the fact that this fovea also appears in the Mesolithic lower jaw as well as in the Ottoman period jaw, suggests that there is no racial significance in the form.

Comparative Measurements of the Belbaşı and Ottoman Period Mandibula

	Ottoman Period		Mesolithic Belbaşı
Bicondilian width	102 mm.		—
Bigonial width	95 mm.		—
Corpus Condylar Height	53 mm.		70 mm.
Minimum Breadth of Ramus	Right 31 mm.	Left 31 mm.	35 mm.
$M_2 - M_3$ Height of the Corpus	Rigtht 22 mm.	Left 24 mm.	34 mm.
$M_1 - M_2$ Heighr of the Corpus	Right 24.5 mm	Left 24.5 mm.	33 mm.
$P_1 - P_2$ Height of the corpus	Right 29.5 mm	Left 28.5 mm.	—
Gonion Angle	Right 127°	Left 120°	120°
Caputulum Mandibular Width	Right 9 mm.	Left 9.5 mm.	10.5 mm.
Caputulum Mandibular Length	Right 20 mm.	Left 20.5 mm.	21 mm.

Astragalus from Belbaşı

Among other small pieces of bone found at Belbaşı was a right astragalus. This is unusually long and in fact exceeds the maximum measurement of the specimens from Gordion which I have examined in detail.[28] The measurements according to Martin's technique are length 57 mm. and width 40.5 mm. The length is equal to that found in the late Chalcolithic and Middle Bronze age people from Jericho, the maximum of which is 57.9 mm.[29] The average length-width index in the Belbaşı astragalus is 71.05; in the Jericho people it is 78.8, Ancient Egyptians (Naqada, Ptolemaic, Roman) 78.0 and in Gordion Roman people 81.0[30] From these indices it can be seen that the Belbaşı Mesolithic astragalus is relatively longer than in the other ancient groups mentioned. As is known, the astragalus in Neanderthal fossil man is relatively short and this indicates that the Belbaşı astragalus is not so primitive, but again it is not close to modern groups in this respect.[31]

As regards the morphological characteristics, these do show some primitive tendencies. For instance, there is an anterior prolongation of the medial facet of the trochlea and the facies maleolaris medialis is projected forwards to the same extent. On the other side the lateral facet of the trochlea is also prolonged forward on to the collum tali. On the latter there is a large facet extending as far as the head of the astragalus. This is no doubt a squatting facet which can also be seen in the late Chalcolithic and Middle Bronze Age Jericho people and in the Gordion Roman people.[32] The collum tali is relatively short and the angle of the collum tali is 23°. This figure is the same as that in Melanesians, Negros and the people of Terra del Fuego and the same degree is found in La Chapelle and La Ferrassie I fossil man. Another important angle in the astragalus is the caput torsion angle and in the Belbaşı specimen it is 38°. This is the same as that quoted by McCown and Keith for Skhul IV fossil man.[33]

28 Bostancı, 1962. p. 51.
29 Lisowski, Ashton, Ormerod, 1957. pp. 141, 149 Table. 11.
30 Sewell, 1904. pp. 234, 235.
Lisowski, Ashton, Ormerod, 1957. pp. 141, 149, Table II.
31 Boule, 1912. pp. 172, 173.
Martin, 1928. p. 1178.
32 Lisowski, Ashton, Ormerod, 1957. pp. 139, 140, 142.
Bostancı, 1962. pp. 39–40.
33 McCown and Keith, 1939. pp.
Bostancı, 1962. p. 43, Table E.

One of the most noticeable characteristics of the Belbaşı astragalus is the small size of the os trigonum. This is a primitive character, being hardly noticeable in Neanderthal man and not present at all in anthropoids.[34] According to Black the os trigonum is small in Asiatic groups and large in *Europeans.*[35]

Other bones from Belbaşı rock shelter

In the Mesolithic layer of the Belbaşı rock shelter some pieces of human tibia and femur came to light. These show that they had been cut by flint tools and one piece of tibia is particularly interesting. One side has been slit open, no doubt to obtain the marrow, and this would suggest that these Mesolithic people had cannibalistic tendencies. There seems to be no other reason for the cutting of the bone, as there is no evidence to show that it might have been used as a tool.

SUMMARY

Beldibi rock shelter on the Mediterranean coast of Anatolia is a prehistoric site which contains rock paintings and engravings, together with very interesting artistic objects in the stratigraphy and in this is unique both in Turkey and the Middle East generally.

I also discovered another rock shelter called Belbaşı, not far from Beldibi but about 300 metres above the present sea level higher up in the mountains, containing Mesolithic (Sauveterrian and Nebequian type) and late Upper Palaeolithic industry, which I have called Belbaşıan. Both rock shelters yielded some fossil bones belonging to fossil Homo Sapiens.

Some of the fragments of skull from the Mesolithic and Upper Palaeolithic layers of the Beldibi rock shelter had been burned, and the pieces are unfortunately too small to yield any evidence about the physical characteristics of the Beldibi fossil man. Two shafts of femur, probably female, were found in the Mesolithic layer of Beldibi. On both these pieces the linea aspera is moderately developed. The plaster index for these femurs is intermediate between Neanderthal man and Homo Sapiens.

In the Mesolithic layer of the Belbaşı rock shelter, the left side of a human lower jaw came to light. The processus coronoideus was broken, and it was also broken in the front on a level with the first molar. Only three molars are in place. M_1 is very worn away and was probably five-

34 Postancı, 1962. p. 53.

35 Black, 1925. p. 33. Table 15.

cusped and possibly shows dryopithecus pattern. M_2 is four-cusped, shows +4 pattern and is small compared with the others. M_3 is large and obviously six-cusped. M_3 and M_1 exhibit primitive characters and M_3 shows + 6 pattern. It is very probable that the jaw belonged to a female individual of about 18 years of age. The order of eruption is M_1 first, then M_2 and M_3 last. The order of size of these molars is M_1 M_2 M_3 M_1; as can be seen, the smallest one is M_2 and the largest M_3.

The most intersting characteristic of the mandibula can be seen in the processus condilaris. A fovea has been formed on the posterior part of the articular surface of the caput mandibulae. From the posterior side this fovea divides the head of the caput into two. I am of the opinion that phylogenetically it may be a new form and it may be convenient to call it 'fovea caputulum mandibulae'.

After an examination of a large number of Neolithic, Chalcolithic, Copper and Bronze Age mandibulae and also of Turkish specimens from the Ottoman period, only one other case with a similar formation was found. In this lower jaw, a groove on the right condyle in particular divides the processus articularis into two, and there is a small circular posterior fovea very similar to that the Belbaşı jaw, thus forming a double-headed type rather like some described by Hrdlicka.

When the two mandibulae are compared, it can be seen that apart from this similarity, there are important differences. In particular the height of the corpus caputulum mandibulae is 17 mm. more in the Belbaşı specimen. In the latter the edge of the ramus is oblique up to the processus condilaris, while in the modern jaw the edges are slightly concave. A most unusual characteristic in the Belbaşı jaw is a sulcus running between the linea obliqua and the socket of the third molar and extending internally up to the processus coronoideus. Another difference in the morphological characters of the two mandibulae is that in the Belbaşı jaw the linea mylohyoides finishes at a level of 11 mm. from the socket of M_3, but in the modern jaw it extends obliquely right up to the socket level.

The astragalus from the Mesolithic period of Belbaşı is unusually long and the length-width index shows that it is relatively longer than in Ancient Egyptians (Naqada, Ptolemaic, Roman), Jericho people (late Chalcolithic and Middle Bronze Age) and Gordion Roman people. The morphological characters show some primitive tendencies, the most important of which is the anterior prolongation of the medial facet of the trochlea and of the facies maleolaris medialis to the same extent. There is also a squatting facet

on the collum tali. One of the most noticeable characteristics of the astragalus is the small size of the os trigonum, which is a primitive character.

Among other pieces of bone found at Belbaşı is a broken tibia, one side of which had been slit open by flint tools, no doubt to obtain the marrow and this would suggest that these Mesolithic people had cannibalistic tendencies.

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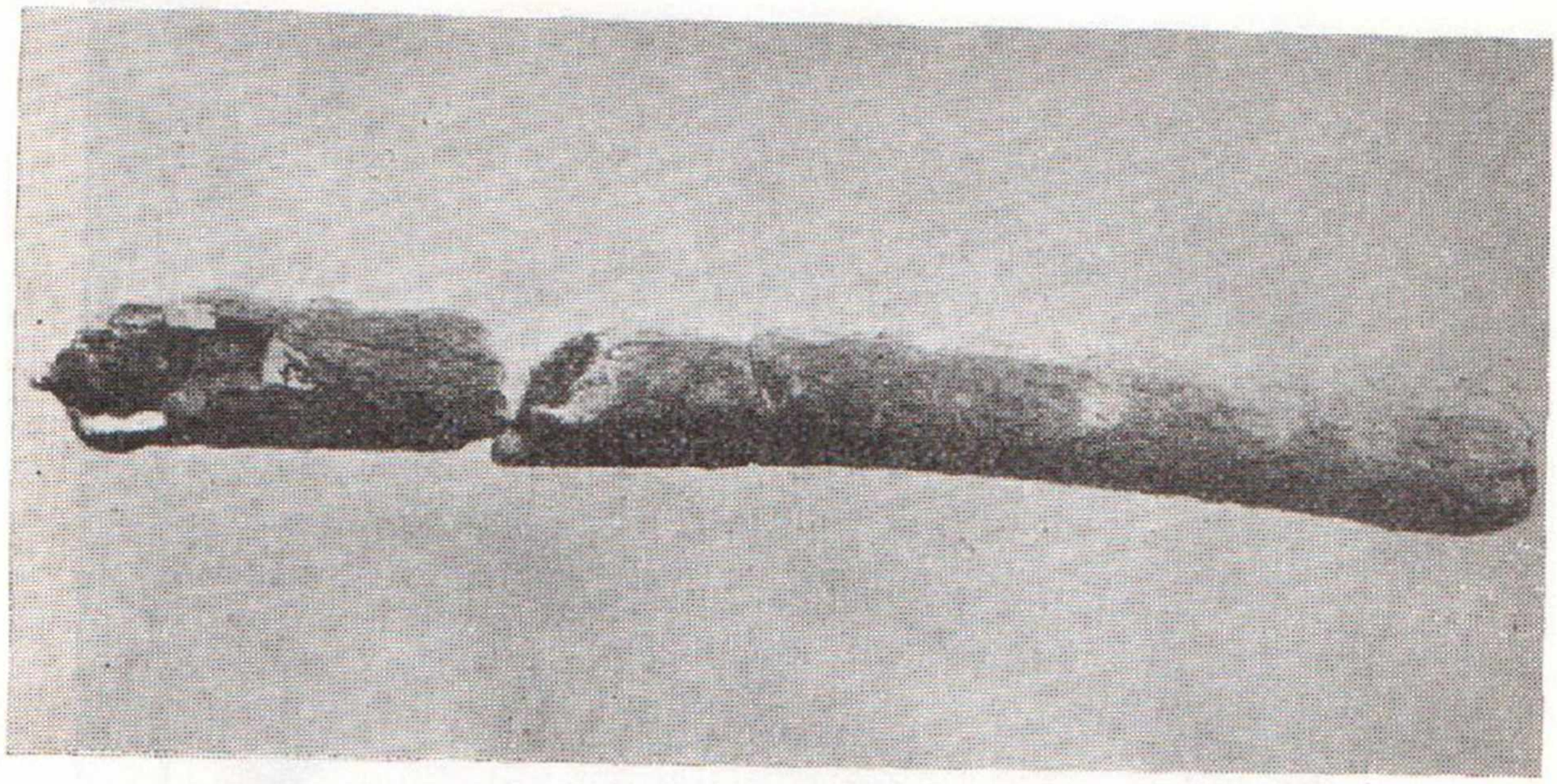

Plate I Two pieces of shaft of femur from Belbaşı Upper Palaeolithic layer D. The larger piece belongs to the left femur (antero-posterior dia neter 27 mm. transverse diameter 23.5 mm. plaster index 114.8, and the smaller one to the right (antero-posterior diameter 28 mm. transverse diameter 24 mm., plaster index 116.17)

Plate II Left side of mandibula from Belbaşı rock shelter viewed from lingual side.

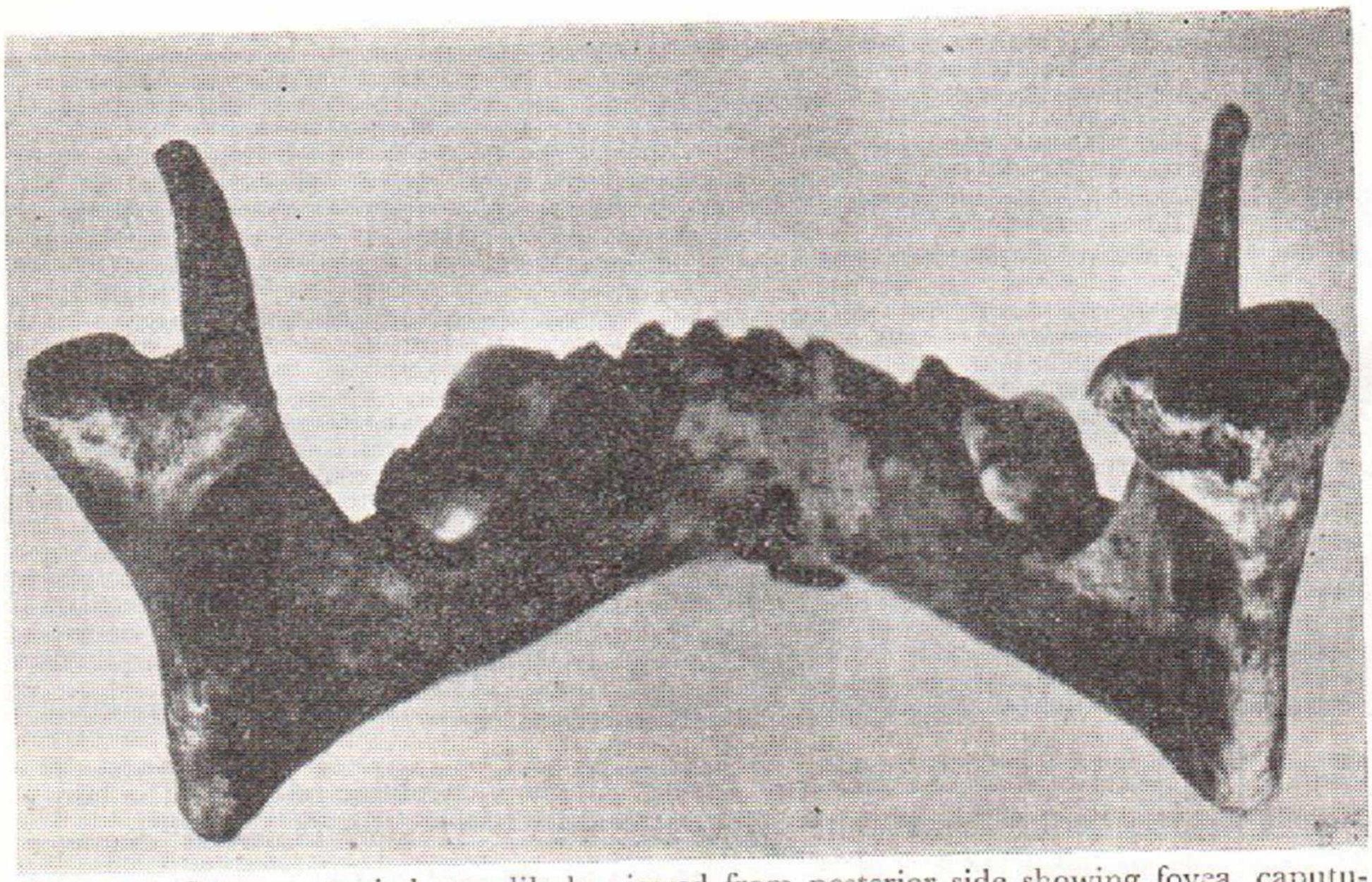

Plate III Ottoman period mandibula viewed from posterior side showing fovea caputulum mandibulae on the processus condilaris.

Plate IV Astragalus from Mesolithic layer of Belbaşı rock shelter viewed from above, showing collum tali facet and prolongation of the medial facets.

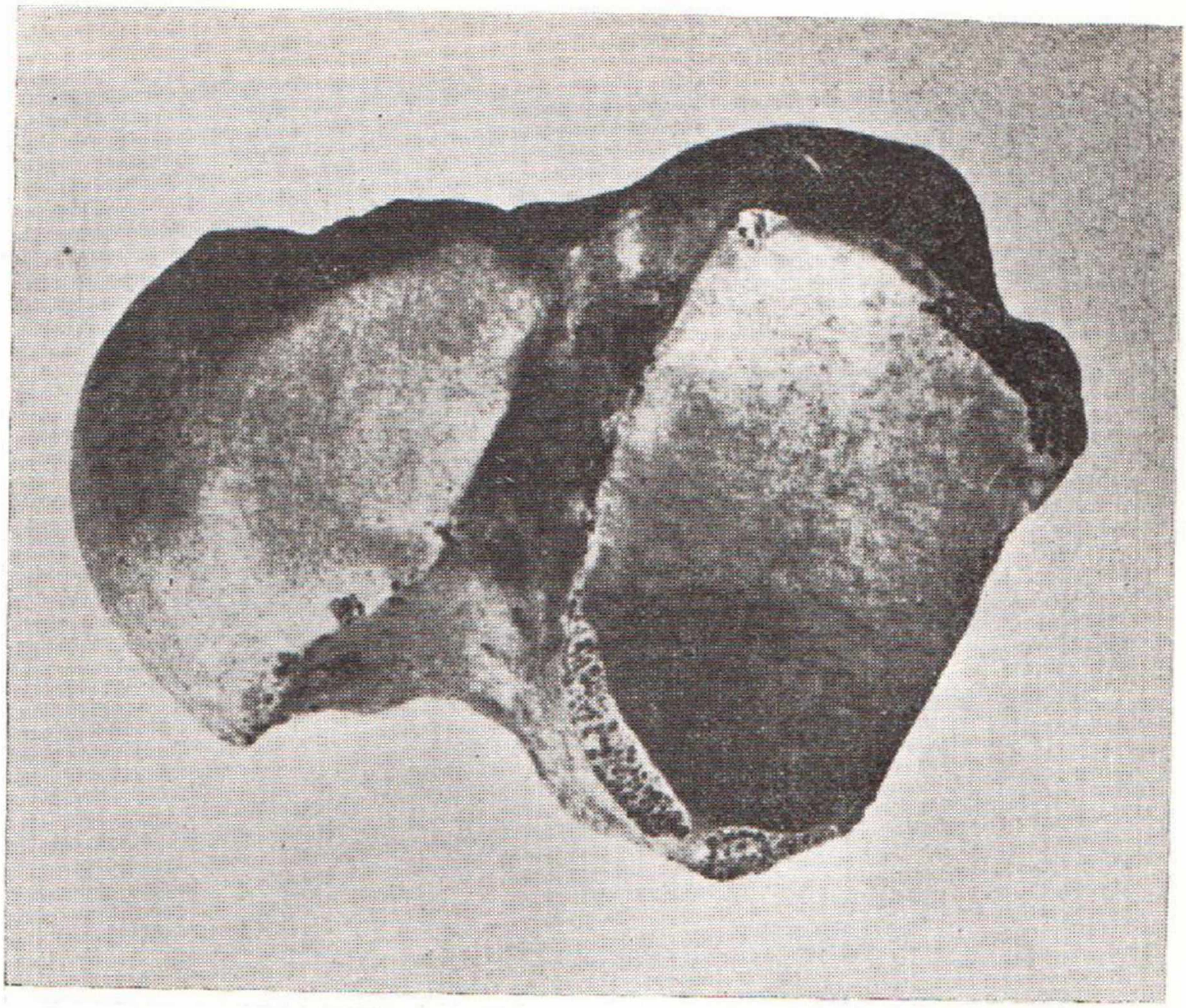

Plate V Same Astragalus viewed from below.

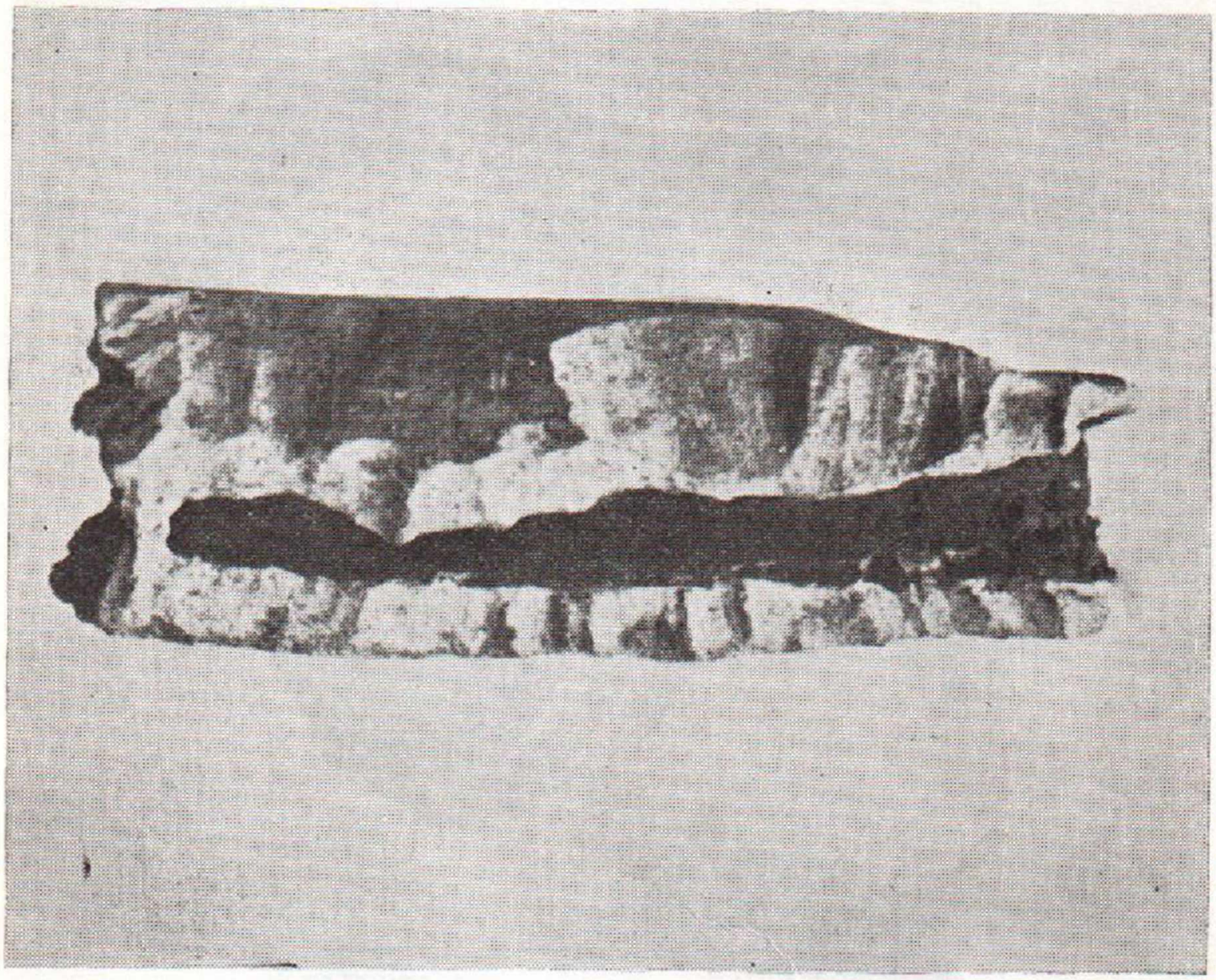

Plate VI Piece of tibia from Belbaşı rock shelter Mesolithic layer showing slit made by flint tools.