

HUMAN SKELETAL REMAINS FROM BEYKÖY (AFYON, ANATOLIA)

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In 1979-81, the French Scientific Research Center financed the survey in a locality called Beyköy within the sub-province of İhsaniye, 40 km. north of Afyon province. During this avticity, Dr. H. Gonnet had opened the grave which she encountered in that region with the permission of General Directorate of Museums. The collected skeletons from this grave were sent for my analysis. In this connection I wish to express my thanks to Dr. H. Gonnet for entrusting the description of these skeletons with me.

Two skeletal remains recovered from a common-grave of twelve rock-graves are dated as of Late Roman or Early Byzantine Period, VI. centuries A.D. by Dr. H. Gonnet.

The upper structure of this common-grave is surrounded by a wall which was constracted of stones measuring 7x8 m. The grave lies in east-west direction and its front side is towards west. The shape of the grave is rectangular and it has an inner step on the north direction.

There are two types of burials in that grave. The first one, lying on its back (female one) and hands are placed parallel to each other on her abdomen. The other type burial, lying towards south on its side with slighty bent knees (the child one). There are no burial gifts in this grave.¹

MATERIAL

The material I have examined are as follows: Beyköy No. 5 (child); Beyköy no. 6 (female).

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The skeletons have been numbered by Dr. Gonnet.

Beyköy No. 5

This skeleton is represented by a cranium (included mandible) and a right broken humerus which has both epiphysis missing.

In the calva; os frontale, os parietals, os occipitale (except basis cranii) and right temporale (except a small missing part of the left temporale) bones have been preserved. Broken part of the left temporal bone has been restored by me.

On the facial skeleton, the right and the maxilla and orbits are also preserved; but both zygomatic arches are broken and missing. The mandible is well-preserved, only the left condyloid process and coronoid process being damaged.

Upper and lower lateral incisor and canine teeth are missing, while the other teeth are preserved in situ. (see table III).

Age And Sex: (No. 5)

All the sutures of the calva, on both ectocranial and endocranial aspects, are still open. The metopic suture is synostosed on both cranial surfaces.

All the deciduous teeth of this individual had erupted and had been used. Of the permanent set only the first upper and lower permanent molars had erupted; but their roots are still incomplete.

The central upper permanent incisor teeth almost erupting; while the lateral upper permanent incisors are still underneath the lateral upper deciduous incisors.

According to the sutural² and dental aging,³ this skull belongs to a child of approximately 7-8 years of age.

As the skull belongs to a child, it is difficult to determine the sex with certainty. Furthermore, because the hipbones are missing, the principal sexing features of the pelvis could not be examined.

² Olivier, G. 1969: p. 172

³ Brothwell, D. 1972: p. 59

The comparison of the first permanent molars of this child with the measurements of the teeth of a mixed series⁴ consisting of Europeans, Ancient Egyptians, Negroes, Melanesians, American Indians and Ancient Anatolians (in the copper age stratum of Kaledoruğu-Samsun) shows that the teeth are rather small.

Although nothing definite can be said about the sex of this child, the size of the first permanent molars and general skull features suggests that this skeleton belong to a boy.

Measurements And Morphological Descriptions Of Cranium No. 5

Measurements which could be taken on this skull are listed in Table I. Measurements described by Martin-Saller (1957), Olivier (1969) and Brothwell (1972). Some measurements could not be taken because of the missing parts of the cranium. Indices have been derived from the measurements (in Table II).

According to Garson's classification the cranial index (84.37) indicates that this child is brachycranial (round headed).

Porion-bregma height-length index (68.12) is hypsicranial (high skull) and the Porion-bregma height-breadth index (80.74) is metriocranial (medium skull) that is, this skull is in the middle category. Although, the transverse frontal index (75.0) is low, both temporal crests diverge upwards and outwards on each side.

Transverse fronto-parietal index value is (66.66) metriometopic, that is, this child has a medium (width) forehead. Generally, in the newborn the frontal bone is relatively large, but lessness relatively in the course of growth.

While sagittal frontal index (115.84) indicates that this child has a flat forehead.

On both sides the temporal fulness is medium, and parietal bosses are moderate. The brow ridges have not yet developed. Metopic suture is synostosed on both cranial surfaces.

In the norma verticalis, the form of the skull vault is ovoid according to Sergi's classification.

In the norma lateralis, development of occiput curvature is medium, in the meantime there is a slight depression at the Lambda region but this is not a plano-occipital flattening. A small wormian

⁴ Setyürek, M. 1951: table 2.

bone has been observed on the left Lamboid suture. Both processus mastoideus are small. The glenoid fossa is still of submedium depth. Because both zygomatic arches are missing, the facial breadth could not be taken, therefore the facial index and facial type are unknown. Other facial measurements have been given in table I. The orbital index (82.85) is mesochonch, in other words the orbits are of medium height in relation to their breadth. Generally, children have a higher index than adults, due to the weak development of the orbital arcades.

The maxillo-alveolar arch index is (131.57) brachyuranic and Palatal index is (85.71) brachysthaphyline; that is, the upper dental arch is relatively broad. But as we know, unless the second upper permanent molar and wisdom teeth erupt, the child is more brachyuranic than the adult.

The nasal indices (58.33) hyperplatyrrhine (very broad nose). Children have always a high nasal index (the value is 65 in the new born because of the growth of the facial mass in height).

The Robustness index of Mandibulae is 43.33 at the foramen mentale level; while the ramus index is (96.77), that is, the shape of the ramus is almost square.

Cranial and facial measurements have been given in table I and indices have been given in table II.

The measurements of the preserved milk and deciduous teeth are listed in tables III, IV, V.

As for the racial type represented, as in the case of sex, here too, the fact that this skeleton is a child of 7-8 years of age, must be taken into consideration, for as is known, many of the racial characteristics reach their ultimate development in the adults. Therefore, it is difficult to determine with certainty to which racial type it belonged.

A Bilateral Osteoporosis on the child cranium from Beyköy (no.5):

Loss of cortical bone is a normal phenomenon of aging. This type, usually referred to as "osteoporosis", involves both a reduction in the thickness of the cortex and an increase in the porosity of the bone.⁵

Osteoporosis can be occur in a restricted area or widespread throughout the skeleton. Various kinds of osteoporosis are in fact

⁵ Ubelaker, D.H. 1978: p. 85

known; for instance, senile osteoporosis, is a generalized process of demineralization of the bony framework of the body, usually developing after 6th decade.⁶ The commonest area to show osteoporotic lesion is the skull where it is usually bilateral and symmetrical. The parietals are particularly affected, less frequently the frontal and occipital bones and rarely the facial sphenoid bones.

Osteoporotic pitting was found on the skull vault, interproximal surfaces of the vertebrae, margins of the sternum and on the medial surface of the clavicle; but rarely on all these bones in the same individual.⁷

Bilateral osteoporosis, close to Lambdoid suture on both parietal bones of the child cranium from Beyköy (no. 5) are observed.

The tissue on the left parietal appears quite defective and has a porotic appearance; while on the right part, this state is less (see the detail on the fig. 7).

X-ray graphs of these porotic compacta region have been taken by giving central beam from 90cm. at 80 mas., 0,12sec., 47KW and from 100cm. at 80mas., 0.16sec., 50KW, and thus their radiological examinations have been made. These regions which show a porotic tissue the compacta is smooth and is similar to the other regions of the cranium (See fig. 13, 14).

This situation has been evaluated as a sequel of a localized inflammatory lesion of the osteoporotic regions of right and left parietals.⁸

A kind of symmetrical osteoporosis, namely *cribra orbitalia*, can be seen on the orbital vault of the children cranium; but on the child cranium of Beyköy (no. 5), this pathological case has not been observed.

Cases of osteoporotic are known in Europe from the Neolithic and later periods. It has been recorded that amongst the Pre-Columbian American Indians, osteoporosis were common.⁹

6 Mc Kern and Stewart, 1957 (in Brothwell, D. 1972: p. 162)

7 Mc Kern and Stewart, 1957 (in Brothwell, D. 1972: p. 162)

8 I would like to express my gratitude to Dr. Yavuzılmaz for his valuable collaboration on the taking of the graphs and the preparation of the report.

9 Pales, L. 1930 (in Brothwell, D. 1972: 162)

The reason for osteoporosis is not known; but according to the various information some cases associated with environmental factors.

Beyköy Mandible No. 6 (female)

The measurements and indices which have been taken on the left half of the mandible belonging to a female aged 25-30, have been shown on the table VII.

Its incisors and canines are missing and both left premolars and molars (M1, M2, M3) are present. The surface of left M3 is not worn out yet and neither caries nor any pathological effects have been observed (see fig. 10)

Beyköy Long Bones: (no. 6)

Both femurs, left humerus, ulna and radius are present and the measurements taken are shown table IX. (fig. 11, 12)

Average height of the statue calculated according to Pearson formulae; this skeleton has been found to be 152.64 cm. (Table X)

As bones related to cranium and post-cranial do not exist, no information could be obtained on other metrical and morphological characteristics.

Summary

Metrical and morphological examinations of the cranium no.5 (child) and no. 6 (female) skeleton fragments recovered from Beyköy have been made.

On both parietal bones osteoporotic lesions have been observed on the child cranium no 5. So far, this type of osteoporosis has not been reported among the ancient Anatolians, except Çatalhöyük findings from Neolithic period (Angel, 1971). Some other osteoporotic cases were reported from ancient Greek and Byblos in Lebanon (Özbek, 1981).

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Table 1
Measurements of Beyköy No.5: The cranium

Maximum cranial length	160.0*
Maximum cranial breadth	135.0
Porion-Bregma height	109.0
Bimastoid breadth	91.0
Frontal arch	101.0
Frontal chord	117.0
Parietal arch	109.0
Parietal chord	127.0
Occipital arch	89.0
Occipital chord	106.0
Minimum frontal breadth	90.0
Maximum frontal breadth	120.0
Upper facial breadth	90.0
Biorbital breadth	79.0
Bizygomaxillary breadth	76.0
Interorbital breadth	17.0
Total facial height	81.0
Upper facial height	51.0
Orbital breadth	35.0 (R) - 35.0 (L)
Orbital height	29.0 (R) - 29.0 (L)
Nasal breadth	21.0
Nasal height	36.0
Superior alveolar arch length	33.0
Superior alveolar arch breadth	50.0
Palatal length	35.0
Palatal breadth	30.0
Minimum ramus breadth	30.0 (R)
Ramus height (right)	39.0 (R)
Symphysal height	22.0
Height of corpus (at foramen mentale)	21.0 (R) - 20.0 (L)
Thickness of corpus (at foramen mentale)	9.1 (R) - 9.0 (L)
Bimental breadth	41.0
Coccyoid height (right)	43.0
Symphysal angle	
Gonial Angle	
Mean thickness of parietal	

* measurements are in mm.

Table II
Cranial indices of Beyköy No. 5

Cranial index	84.37
Cranial height-breadth index	80.74
Cranial height-length index	68.12
Transverse frontal index	75.0
Transverse fronto-parietal index	66.66
Maxillo-alveolar arch index	131.57
Palatal index	85.71
Nasal index	58.33
Orbital index (right and left)	82.85
Interorbital index	21.51
Ramus index	76.92
Index of robustness (mandibular)	43.33 (at foramen mentale)
Sagittal frontal index	115.84
Sagittal parietal index	116.51
Sagittal occipital index	119.10

Table III
The list of upper and lower teeth of Beyköy No. 5

Teeth	Upper	Lower
Incisor central (milk) Lateral	missing	In situ missing
Canine (milk)	missing	missing
First milk molar	In situ	In situ
Second milk molar	In situ	In situ
Second milk molar	In situ	In situ
First permanent molar	In situ	In situ

Table IV
Measurements of Beyköy No. 5: The Deciduous Teeth

Maxillary Teeth	Length Mesial-Distal	Breadth Buccal-Lingual	Robustness Value	Crown Index
I	—	—	—	—
I	—	—	—	—
c	—	—	—	—
m ¹ (right)	5.5	8.0	4.0	145.45
m ¹ (left)	6.0	7.0	42.0	116.66
m ¹ (right)	8.0	8.0	64.0	100.0
m ¹ (left)	7.0	7.5	52.5	107.14

Table V
Measurements of Beyköy No.5: The Deciduous Teeth

Mandibular Teeth	Length MD	Breadth BL	Robustness Value	Crown Index
i ₁ (right)	6.0	4.0	24.0	66.66
(left)	4.0	4.0	16.0	100.0
i ₂	—	—	—	—
c ₁	—	—	—	—
m ₁ (right)	6.5	5.5	35.75	84.61
(left)	6.0	6.5	39.0	108.33
m ₂ (right)	8.0	7.5	60.0	93.75
(left)	9.0	8.0	72.0	88.88

Table VI
Measurements of Beyköy No.5: The Permanent Teeth

	Length MD	Breadth BL	Robustness Value	Crown Index
UPPER M ₁ (right)	9.0	10.0	90.0	111.11
(left)	9.0	9.0	81.0	100.0
LOWER (right)	10.0	10.0	100.0	100.0
LOWER (right)	10.0	10.0	100.0	100.0
(left)	10.5	10.0	105.0	95.23

MD — (Mesial-Distal)
BL — (Buccal - Lingual)

Table VII
Measurements of Beyköy No.6: The Mandible

Symphyseal height	28.0
Corpus height (at foramen ment.)	28.5
Molar height (at M ₁ — M ₂) (left)	25.5
Corpus Thickness (at for. men.)	12.1
Ramus height (left)	55.0
Minimum Ramus breadth (left)	34.0
Coronoid height (left)	53.0
P ₁ + M ₁ length (left)	41.0
Gonial angle (left)	
Symphyseal angle	
INDICES:	
Ramus index	61.81
Index of robustness	42.45

Table VIII
Measurements of Beyköy No.6: The Permanent Teeth

Mandibular Tooth	Length	Breadth	Robustness Value	Crown Index
C ₁ right left	7.0 —	5.5 —	38.5 —	78.57 —
P ₁ right left	6.5 —	5.5 —	35.75 —	84.61 —
M ₁ right left	— 9.5	— 9.0	— 85.5	— 94.73
M ₁ right left	— 8.5	— 9.0	— 76.5	— 105.88
M ₂ right left	— 9.0	— 9.5	— 85.5	— 105.55

Table IX
The Maximum Lengths of Long Bones of Beyköy No. 6

RIGHT	Humerus	Ulna	Radius	Femur
	—	241	—	404
LEFT	292	—	220	405

Table X
The Stature* of Beyköy No. 6

Humerus	Right	—
	Left	151.78
Radius	Right	—
	Left	154.7
Femur	Right	151.41
	Left	151.61
Femur + Humerus		151.77
Humerus + Radius		153.36
Mean of stature		152.64 cm.

* According to formulae of Pearson



Fig. 1 The frontal view of the Beyköy cranium No. 5

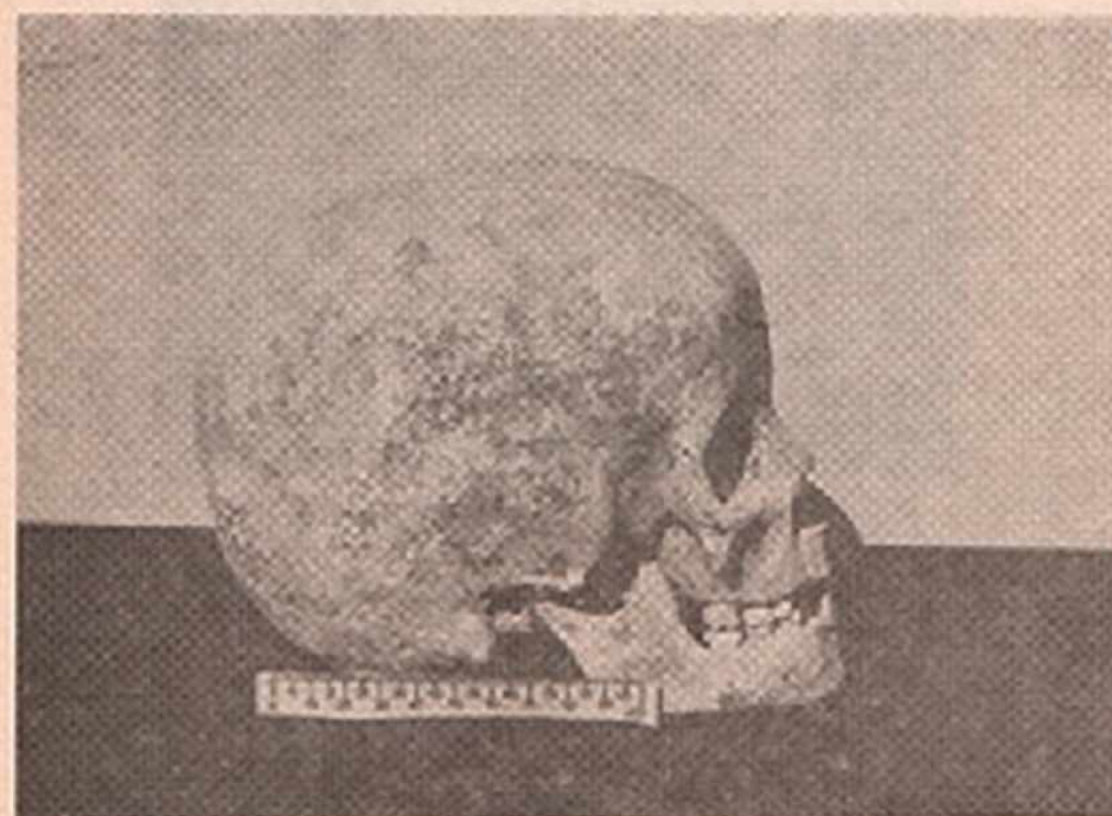


Fig. 2 The lateral view of the Beyköy cranium No. 5

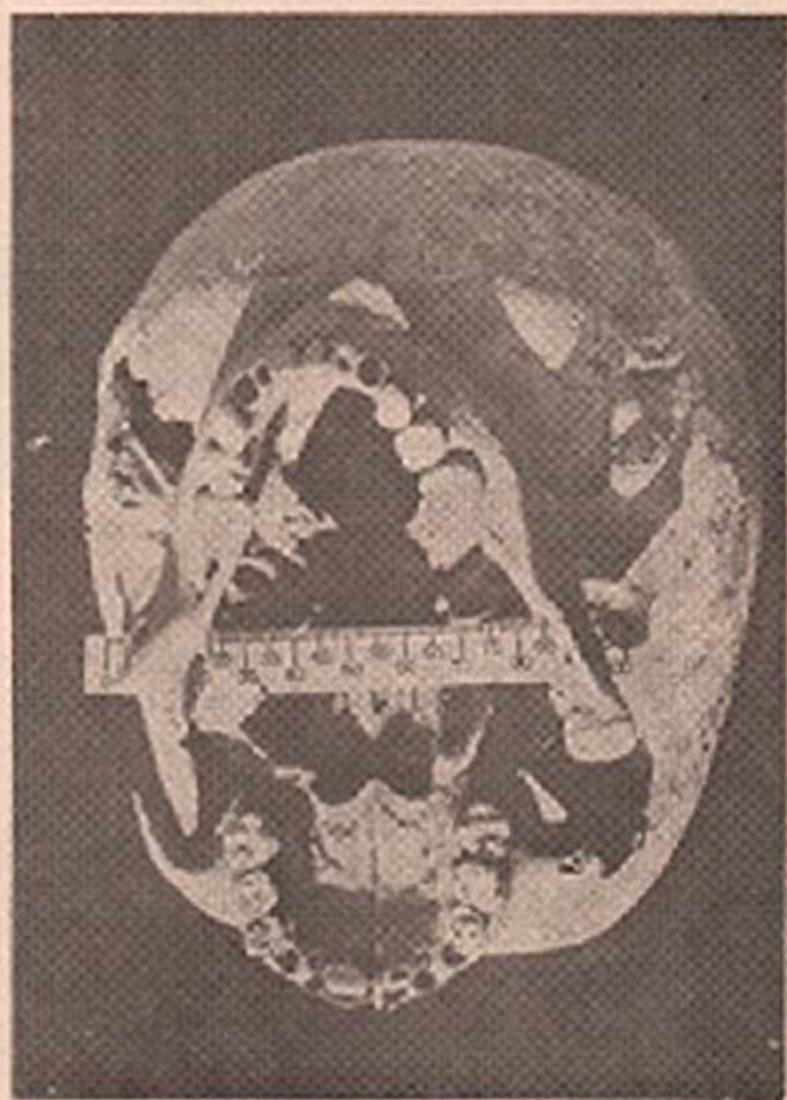


Fig. 3 The basilar view of the Beyköy cranium No. 5

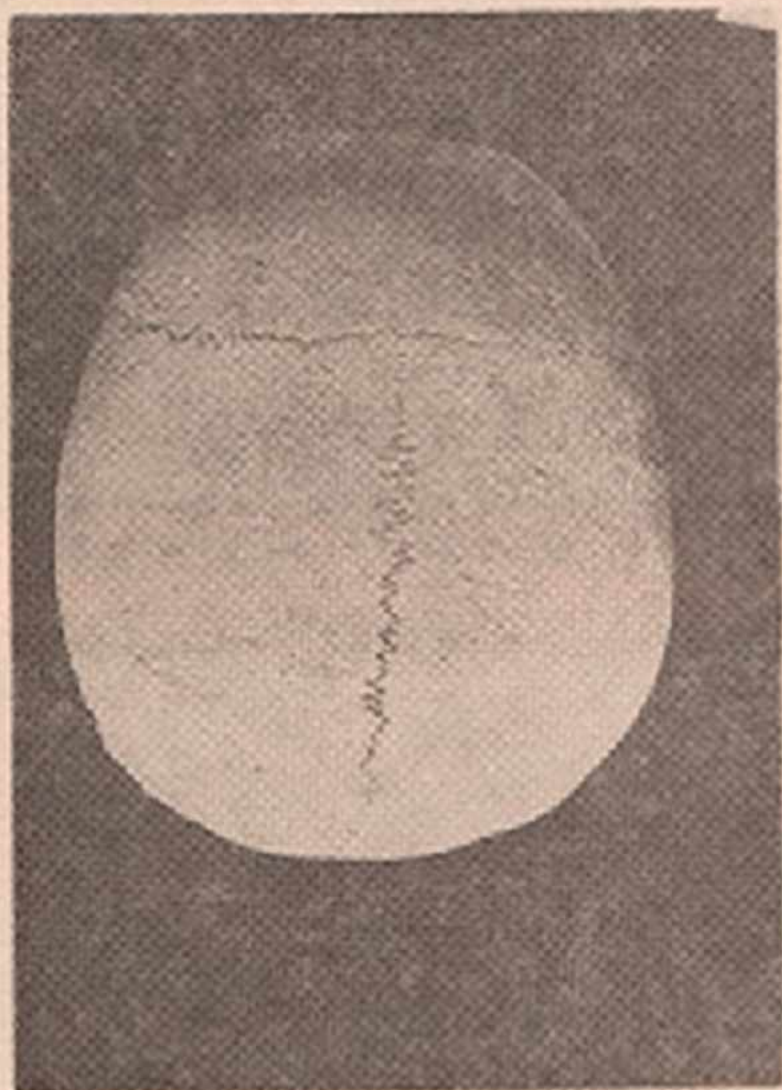


Fig. 4 The vertical view of the Beyköy cranium No. 5



Fig. 5 The posterior view of the Beyköy cranium No. 5



Fig. 6 Bilateral osteoporosis of the Beyköy cranium No. 5 (from posterior view) (on the left parietal bone)



Fig. 7 Bilateral osteoporosis of the Beyköy cranium No. 5 (on the left parietal bone from the detailed plane)

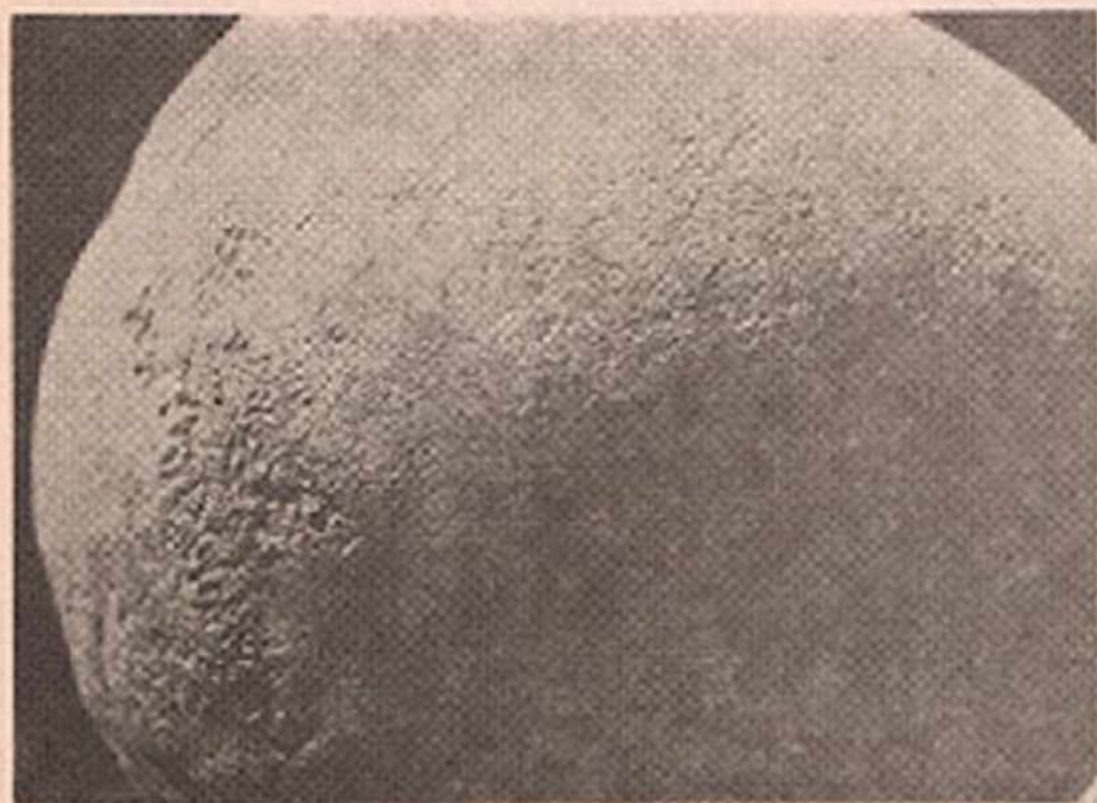


Fig. 8 Bilateral osteoporosis of the Beyköy cranium No. 5 (from posterior view, on the right parietal bone)

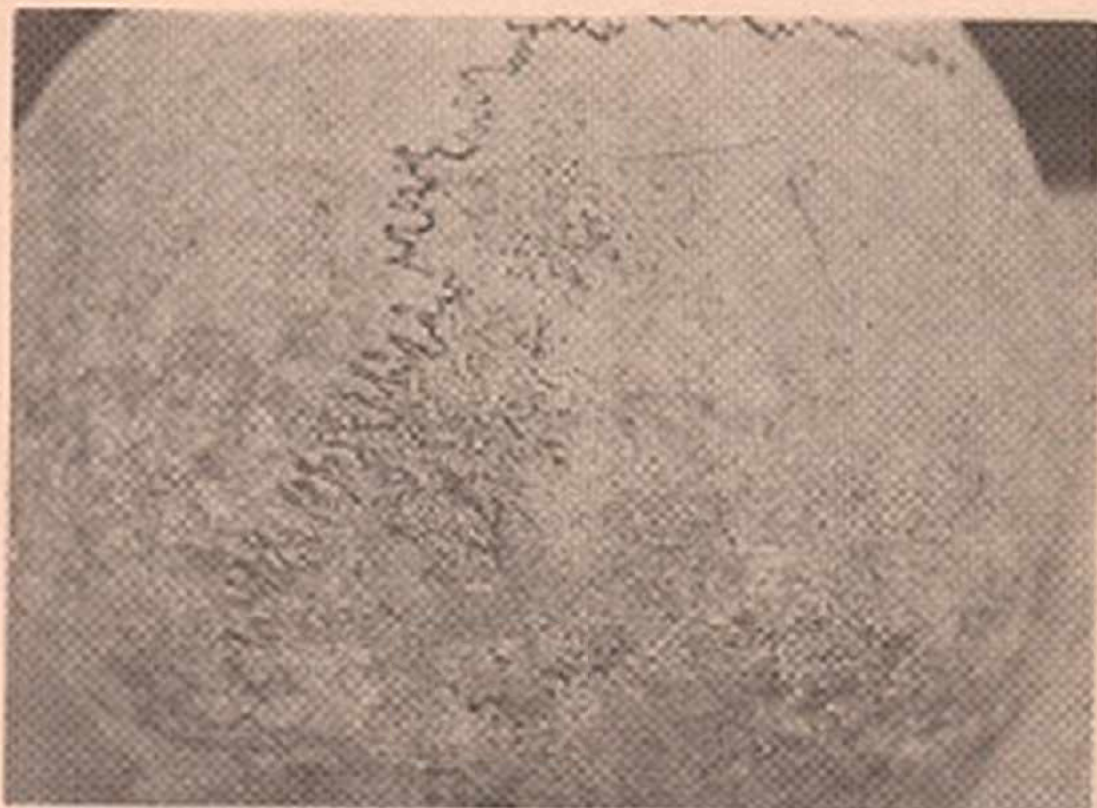


Fig. 9 Bilateral osteoporosis of the Beyköy cranium No. 5 (on the right parietal bone, from the detailed plane)

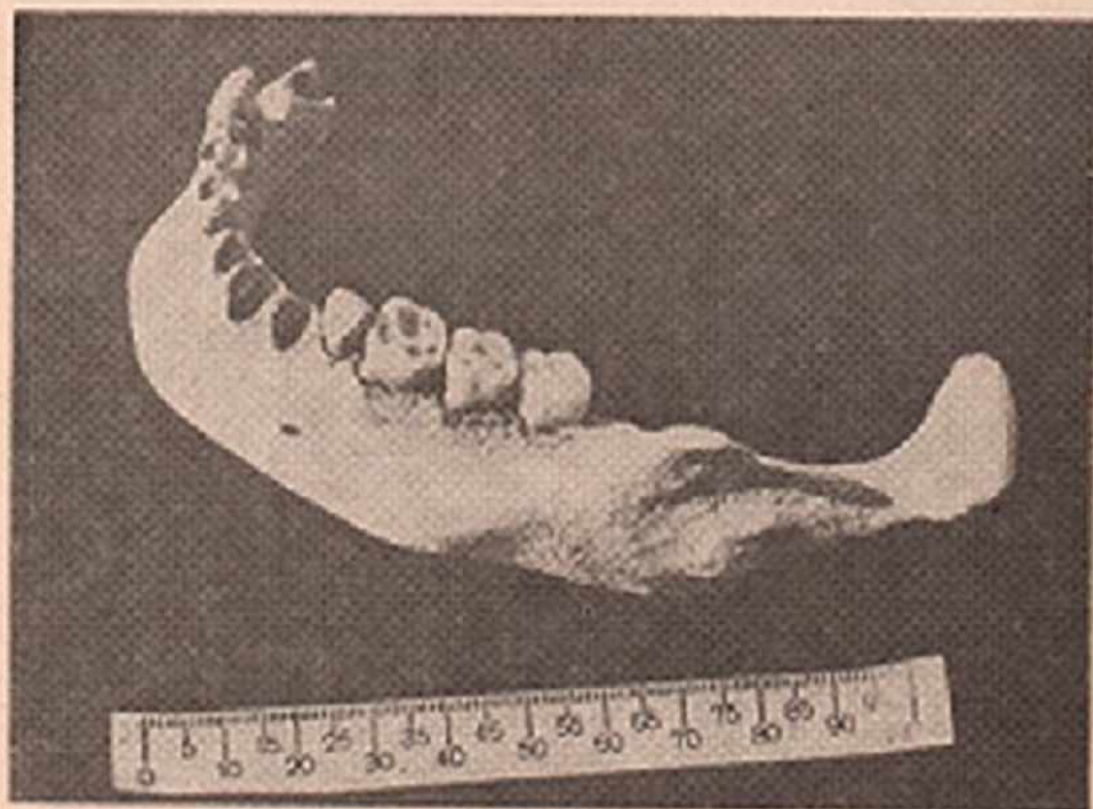


Fig. 10 The left-half mandible of the skeleton Beyköy No. 6 (female)

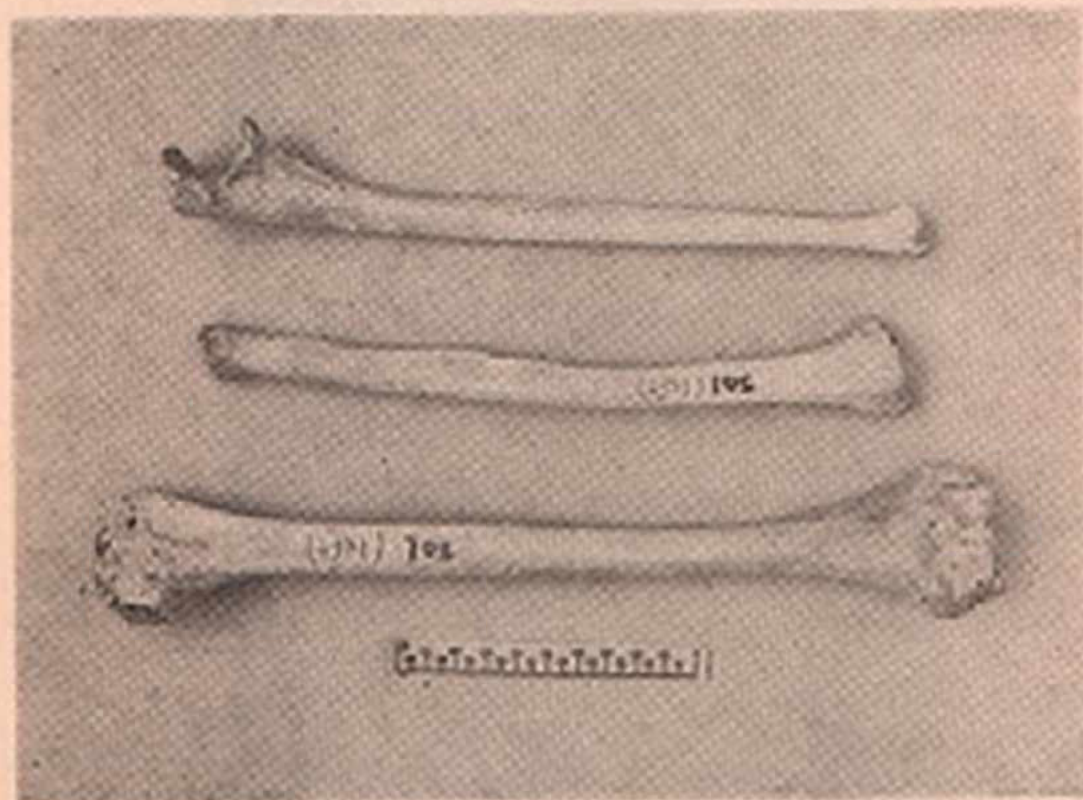


Fig. 11 The long bones of the skeleton Beyköy No. 6 (left humerus, left radius and right ulna)

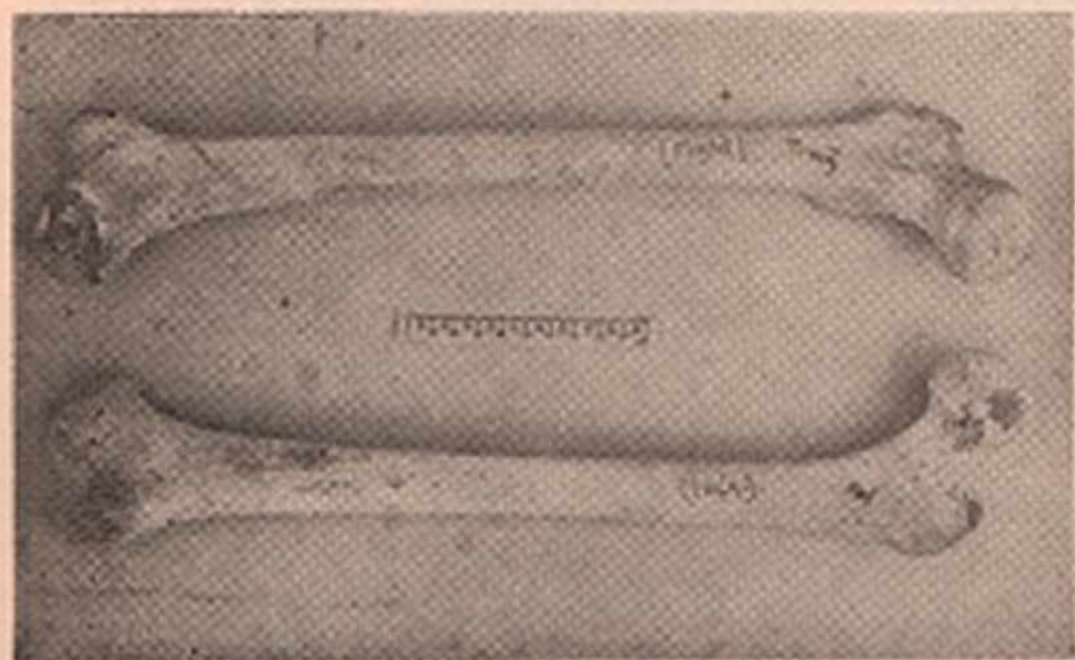


Fig. 12 The long bones of the skeleton Beyköy No. 6 (left and right femur)



Fig. 13 The X-ray film shown osteoporosis on the left parietal bone (Beyköy no. 5)

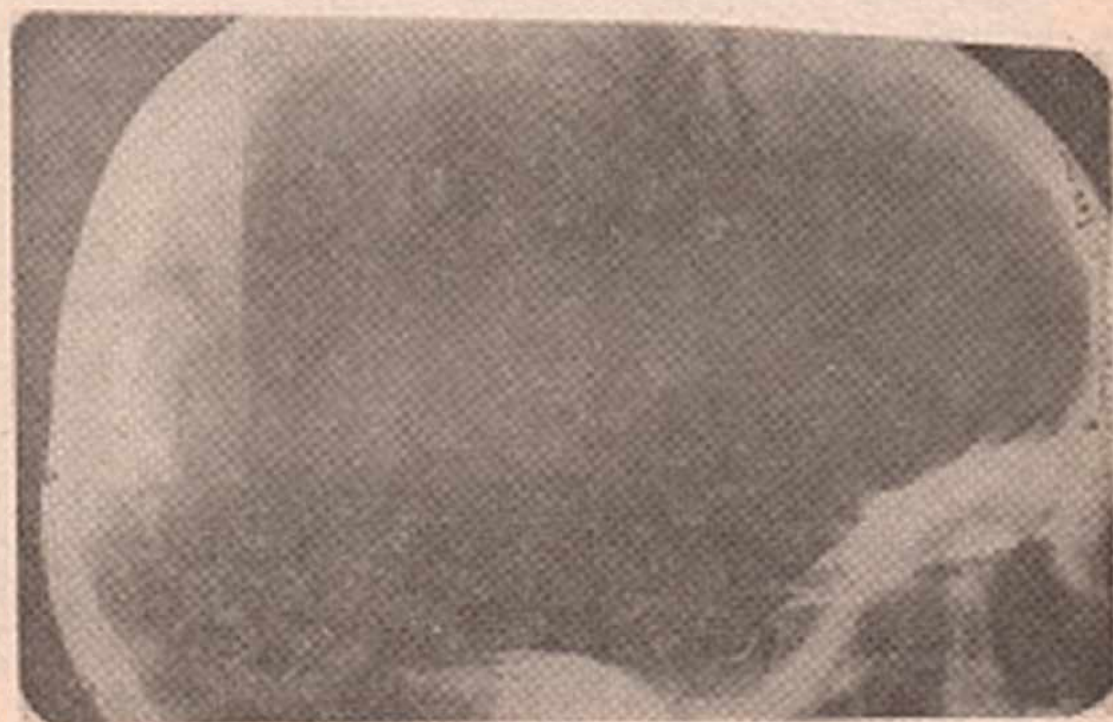


Fig. 14 The X-ray film shown osteoporosis on the right parietal bone (Beyköy no. 5)