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ANTHROPOLOGICAL ANALYSIS OF SKELETAL REMAINS FROM ROCK TOMBS AT NAGA EL-FARIK IN EGYPTIAN NUBIA

EUGEN STROUHAL

INTRODUCTION

In the course of preliminary archaeological investigations of the northern concession area carried out by the Expedition of the Czechoslovak Institute of Egyptology of the Charles University to Nubia in 1964, three rock tombs were discovered to the south of the village of Naga el-Farik (Murwaw settlement). Owing to the fact that they lay relatively low above the water level of the Nile and were threatened by early flooding the Nasser Lake, the head of the expedition, † Prof. Dr. Z. Žába, decided to have them archaeologically excavated during May 11th to 17th, 1964. The archaeological material showed that a collective burial ground of a group of persons from the period of the New Kingdom was involved. The archaeological publication of Naga el-Farik rock tombs is being prepared for the Nubian Series of the Czechoslovak Institute of Egyptology, Charles University, Prague.

METHODS

In principle the classical method of Martin (1928) and Martin et Saller (1956), augmented by certain data of Olivier (1961) and Eickestedt (1944), was respected The figures of the dimensions and indices according to Martin and Martin et Saller are given in brackets after their names. The method of some supplementary measurements is always properly described. For estimating the sex of some fragments, the variance of metric freatures for men and women, established in a series of Group X from Wadi Qitna, was also employed (Strouhal, 1966) next to the usual descriptive features.

ROCK TOMB No. 1

The grave had evidently been almost entirely emptied in earlier times, so that only very little of the fragmentary material survived. According to two characteristic frontal bone fragments (outer half of the upper orbital margin with the adjacent section of the orbital roof and the frontal squama) two individuals, to whom also other fragments could be ascribed, were reliably distinguished.

Individual A

The fragment of the frontal bone originates from the left side. The robusticity of the bone is considerable, the upper margin of the orbit is thick and slightly pointed. The beginning of linea temporalis is very marked with roughened small frames of osteophytes. Sinus frontalis was, according to the rest of the lateral section evident on the breakage, relatively voluminous.

In morphological respect it is possible to add another 10 smaller fragments of the skull vault, the thieckness of which varies between 6 and 9 mm, to the mentioned fragment. As long as sutures have been preserved, they are externally in beginning fusion, while internally completely closed. An exception is formed only by the open lambdoid suture.

Also the radial part of the distal epiphysis of the right humerus belongs because of its morphology to individual A. It is rather robust, the preserved part of the trochlea and the capitulum being of large size. The epiphysis was fully united with the diaphysis, without perforation of fossa olecrani.

Another 9 fragments of long bones betray by their great robusticity their appurtenance to the same individuad.

The sex. The considerable robusticity of the fragments, their large dimensions, the morphological characters (upper edge of orbits, sinus frontalis) and the muscular relief (linea temporalis) speak with great probability for the male sex.

The age. The cranial sutures in advanced closing and small osteophytical raughening of linea temporalis suggest the period of maturus (40 to 50 years).

Individual B

The frontal bone fragment comes from the right side and exhibits, compared with the fragment from the other side of individual A, much smaller dimensions and a marked gracility. The upper edge of the orbit is thin. The beginning of linea temporalis is indicated by a negligible groove.

Another 6 small fragments of the skull cap are 3 to 6 mm thick. The preserved parts of the sutures are open without exception.

The proximal half of the right tibia is small and

gracile. Linea poplitea is indicated by a medium-deep groove. The anteroposterior diameter in the level of foramen nutricium makes 15 mm, the transverse diameter 11 mm, the cnemic index 73,3 (eurycnemia).

The sex cannot be determined owing to the low age.

The age. According to the dimensions of the tibia and the character of the other skeleton, the period of infans I is involved (close to 3—5 years).

ROCK TOMB No. 2

During the excavation of this grave a large number of skeletal remains was found, which except one calvarium (No. 1), incomplete calva (No. 31) and humerus (No. 4) were all in small fragments. Already for the total number of determinable fragments (729) it is evident that they come from a larger number of individuals. The breaking edges of the fragments are old and completely weathered and with insignificant exceptions there is no anatomical association among them. The explanation, supported also by the conclusions of the study of the archaeological material, presents itself that the contents of the grave was intentionally smashed in the past.

Owing to these findings, the material cannot be treated in the usual way, consisting in the restitution of the particular individuals. Therefore the anatomical analysis of the preserved parts of the skeleton was used. This treatment focused primarily on the establishment of the number of buried individuals, the representation of adults and juveniles and the determination of the proportion of adult men and women. Scattered findings on certain descriptive features, augmented by several metric data may render only a very general idea on the type of the body structure and the anthropological character of the group of persons buried in this rock tomb.

Localization of anthropological finds

The interior layout of tomb No. 2 will be described in the archaeological report which is being prepared for publication by the Czechoslovak Institute of Egyptology. In the documents on the finds of the anthropological material the excavators distinguished the entrance area (A), the northern half of the antechamber (B), the southern half of the antechamber (C), the northeastern (D), the southeastern (E), the northwestern (F), and the southwestern (G) quandrants of the actual burial chamber, and, finally, the neighbourhood of the tomb (H). The localisation of finds of the individual fragments according to anatomical criteria is presented in Table 1.

From this Table it is to be seen that the anthropological fragments were scattered both in the burial chamber and in the antechamber, in the entrance, as well as in the close neighbourhood of the tomb. At the same time, however, differences in the frequency of the fragments in the individual parts of the tomb can be noticed. So in the burial chamber a strikingly smaller number of fragments (212) than in the antechamber (370) was found. The latter's groundplan was only insiginificantly larger then that of the burial chamber. In the southern half of the antechamber more fragments (232) were found than in its northern half (135). In the burial chamber the finds concentrated mainly in quadrant D, adjoining the antechamber (113), and in the following quadrant F (73). The number of fragments found in these two quadrants, i.e. in the

TABLE 1

Localisation of anthropological fragments in Tomb No. 2

Fragments of:	Area									Sum:
	A	B	C	D	E	F	G	H	?	
Skull	1	51	91	33	3	11	9	8	23	230
Mandible	1	6	5	10	3	1	—	—	4	30
Vertebrae	—	14	28	5	2	4	1	—	16	70
Sacrum	—	1	7	6	—	1	—	—	3	18
Ribs	—	8	5	1	—	—	—	—	5	19
Scapula	—	1	7	4	1	1	—	1	5	20
Clavicula	1	—	2	3	2	—	—	—	1	9
Humerus	—	4	12	10	1	17	1	1	10	56
Radius	—	4	9	3	—	—	—	—	1	17
Ulna	—	2	4	4	—	1	—	1	7	19
Coxae	—	10	29	9	1	10	1	—	8	68
Femur	—	17	16	7	2	11	4	—	25	82
Tibia	—	11	10	8	2	6	2	—	8	47
Fibula	—	—	1	2	—	—	1	—	4	8
Patella, talus, calcaneus	—	6	6	8	—	10	—	1	5	36
Total	3	135	232	113	17	73	19	12	125	729
Relation of finds in antechamber and burial chamber	370 : 212									

northern half of the tomb (186) is in striking disagreement with the insignificant number of fragments from the southern half of the tomb (36, of which 17 in quadrant E and 19 in quadrant G). It appears that through the actions of grave robbers the material in the burial chamber was shifted from the southern to the northern half. It is probable that the material found in the antechamer was thrown out from the burial chamber. It is typical that most finds were always made in most remote parts of the tomb (calvaria No. 1 and incomplete calva No. 31 in quadrant G, humerus No. 4 in quadrant F), where they had escaped the notice of those who intentionally destroyed the bones.

Fragments from Calvarium

1. Calvaria No. 1

Preserved as a whole but for the base of the occipital bone and the middle part of the sphenoid bone. Missing is the entire facial skeleton (Fig. 2).

Descriptive features:

The calvaria is robust in general.

Norma frontalis. The medium-high and narrow forehead bears a medium tubera frontalia, merging in the medio-sagittal line. Metopismus is not present. The upper edge of the orbitae is medium-strong and slightly sharped.

Norma lateralis. Glabella (Broca 2) and arcus supraorbitales (Eickstedt 2) are poorly developed. The profile of the forehead is perpendicular, bending from the boundary of the lst and 2nd thirds. Further the curvature becomes lesser and continues to the vertex, which is situated on the border of the ist and 2nd quarters of the sagittal suture. Then follows a regular curvature across the lambda, where there is an insignificant flattening, to the slightly bulged upper part of the occipital squama. Under the feable protuberatintia occipitalis externa (Broca 1) there is a slight concavity of the profile. The mastoid processes are medium long, the left being less, while the right more voluminous, both slightly are medium strong, on the left a more marked paramastoid process is developed. The pterion is preserved only on the right side and has the usual H-shape (type "a" of Eickstedt). The temporal relief is only slightly indicated.

Norma verticalis. The skull is short and relatively medium broad, mesocranic, the contours form an ovoid in which tubera parietalia stand out markedly. In the coronal suture (C_3) slight beginnings of obliteration can be seen, all other sutures being open.

Norma occipitalis. The contour is of a house-like shape, but the lateral walls are almost vertical. The sagittal suture is depressed within the range of S_2 to S_4. The occipital relief is more marked. Lineae nuchales superiores form a 40 mm wide low ridge, continuing in the lateral direction as an edge. Lineae nuchales inferiores are represented 25 mm from the median line by low rounded tuberosities. In the lambdoid and mastoidooccipital sutures, tiny wormian bones are present.

TABLE 2

Metric features of Calvaria No. 1 (adult female)

Dimensions (in mm)	
Maximum length of skull (1)	173
Maximum breadth of skull (8)	136
Minimum frontal breadth (9)	96
Maximum frontal breadth (10)	136
Biauricular breadth (11)	124
Maximum breadth of occipital bone (12)	108
Mastoideal breadth (13)	104
Horizontal curve (23)	495
Transverse curve (24)	313
Sagittal curve (25)	357
Sagittal frontal curve (26)	130
Sagittal parietal curve (27)	117
Sagittal occipital curve (28)	110
Sagittal frontal cord (29)	110
Sagittal parietal cord (30)	105
Sagittal occipital cord (31)	93
Upper facial breadth (43)	100
Anterior interorbital breadth (50)	21
Indices	
Cranial index (I 1)	78.6
Transversal cranial vault index (I 11)	39.6
Transversal frontal index (I 12)	86.5
Transversal frontoparietal index (I 13)	70.6
Transversal parietooccipital index (I 14)	79.4
Frontosagittal arch index (I 19)	36.4
Parietosagittal arch index (I 20)	32.8
Occipitosagittal arch index (I 21)	30.8
Frontal curve index (I 22)	84.6
Parietal curve index (I 24)	89.8
Occipital curve index (I 25)	84.5
Breadth-length index of the squama occipitalis (I 29)	86.1
Breadth index of the skull $\left(\frac{11}{8} \times 100\right)$	91.2
Interorbital index $\left(\frac{50}{43} \times 100\right)$	21.0

The sex. All diagnostically important descriptive features as well as the small dimensions unambigously determine the female sex.

The age. From the beginning obliteration of C_3, the age of adults can be inferred (30 to 40 years).

Morphological type. The skull is mesocranic. The forehead, according to the transversal frontal index, is medium proportioned, according to the transversal frontoparietal index is found on the lower border of the eurymetopy or megasemy, respectively. In the mediosagittal plane the frontal arch forms the longest stretch. The perpendicular profile of the forehead is connected with sex. Only the merging of the frontal tubera does not exclude the possibility of a Negroid influence. Owing to the absence of other diagnostic features, this cannot be unambiguously proved.

2. Frontal Bone — Fragments from Medial Region

In this chapter are included, above all, fragments bearing the whole or part of the glabella and the entire or lower half of crista galli, at least fundus of sinus frontalis always being present. These frag-

ments are valuable both for the determination of the number of individuals, owing to the fact that a medial, unpaired part is involved, and for the attempt to determine the relative representation of men and women, because the development of the glabella belongs among the important secondary sexual characters of the skull (Borovanský, 1936). All fragments exclude one another.

List of fragments:

No. 2 — complete frontal bone
No. 3 — frontal bone without right lateral third
No. 4 — right lower quarter of frontal bone with adjacent glabellar region
No. 5 — lower third of frontal squama without both lateral edges with adjacent glabellar region
No. 6 — right medial part of frontal bone with adjacent small portion of the left medial part
No. 7 — glabellar region with adjacent section of medial lower part of frontal squama; to the fragment, another piece from the left lateral part of the frontal bone with facies temporalis and part of the orbital roof was added by glueing
No. 8 — incomplete glabellar region
No. 9 — incomplete glabellar region
No. 10 — incomplete glabellar region with adjacent section of medial lower part of the frontal squama
No. 11 — upper edge of left orbita with adjacent portion of left lower part of frontal squama and with left half of glabella
No. 12 — incomplete glabellar region with adjacent portion of medial lower part of frontal squama
No. 13 — medial lower section of frontal squama with adjacent upper edge of glabella
No. 14 — medial lower section of frontal squama with adjacent upper edge of glabella
No. 15 — medial lower section of frontal squama with adjacent upper edge of glabella
No. 15/1 — incomplete right half of frontal squama from coronal suture (C_2) obliquely across crista galli to fundus sinus frontalis
No. 15/2 — glabellar region and adjacent part of edge of right orbit.

In addition, fragments of the middle part of the frontal squama with the upper section of crista galli (Nos. 16—18), which do not exclude one another with the above listed parts of fragments, but without anatomical connection with them, were distinguished.

All descriptive features that could be established on the fragments have been summarized in Table 3 together with the measured values of the

TABLE 3

Descriptive features and thickness of medial parts of frontal bones

Feature	Fragment (calvaria) No																
	2	3	4	5	6	12	14	15/1	15/2	1	7	13	8	9	10	11	15
Glabella	2	2–3	2	3	3	3	—	—	3	2	1	1–2	2	1–2	1–2	1–2	—
Arcus superciliaris	3	2	2	1–2	3	—	1	—	2	2	1	1	1–2	1–2	2	1–2	1
Upper margin of orbita	1a	—	2b	2b	2a	—	—	—	—	2a	2c	—	—	—	—	2a	—
Tubera frontalia	—	2§	1§	1§c	1§c	—	—	1	—	2§	—	2	—	—	—	—	—
Metopismus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Profile of squama frontalis	2	2	2	1	1	1	1	1	—	3	2–3	3	—	—	3	3	3
Sinus frontalis	2	2	2	2	2	2	—	—	—	—	1–2	3	1–2	1–2	1	1	—
Crista galli	2	3	2	1–2	1–2	3	2	2	—	—	1	2	—	1–2	1–2	—	0–1
Thickness of squama frontalis (mm)	6/6	7/7	5/5	6/6	5/5	4/4	–/6	5/6	—	—	6/6	4/–	—	—	4/4	—	4/4
Probable sex	M	M	M	M	M	M	M	M	M	F	F	F	F?	F?	F?	F?	?
Probable age	adult												adult or juvenile				juven.

Explanatory Notes:

Glabella: according to Broca's classification (Martin 1928)
Arcus superciliaris: according to the classification of Eickstedt (1944)
Upper margin of orbita: 1 — thin, 2 — medium, 3 — thick; a — acute, b — middle, c — rounded
Tubera frontalia: 1 — light, 2 — medium, 3 — strong; c — carina, § — confluenting in the mid-line
Metopismus: + — present, 0 — absent
Profile of squama frontalis: 1 — oblique, 2 — regulary rounded or medium, 3 — vertical
Sinus frontalis: 1 — small, 2 — medium, 3 — large
Crista galli: 1 — low, 2 — medium, 3 — high
Thickness of squama frontalis: measured 1 cm laterally from the mediosagittal plane in the level of the middle part of crista galli, left/right
Sex: M — male, F — female, ? — undetermined

thickness of the frontal squama and with the determination of the probable sex of each fragment. Attached are also data on the same region on calvaria No. 1.

Several metric data on frontal bone No. 2 have been compiled into Table 4.

TABLE 4

Metric features of frontal bone No. 2 (adult male)

Dimensions (in mm)	
Minimum frontal breadth (9)	86
Maximum frontal breadth (10)	113
Sagittal frontal curve (26)	130
Sagittal frontal cord (29)	114
Upper facial breadth (43)	99
Anterior interorbital breadth (50)	22
Indices	
Transversal frontal index (I 12)	76.1
Frontal curve index (I 22)	87.7
Interorbital index $\left(\frac{50}{43} \times 100\right)$	22.2

Pathological finding. On fragment No. 17 ten mm to the left of the upper end of crista galli the internal lamina is concavely lowered (diameter 10 mm, lowered by 2 mm, and thus the thickness of the frontal squama in this point is decreased). The surface of the depression is covered with tiny punctures. Obviously, traces of exposure of diploë are concerned. The formation arose probably through pressure of a local intracranial process, leading to usuration.

The fragment represents an adult individual, but the sex cannot be determined.

Number of individuals. In the material a total of 16 fragments of the frontal bone with glabella and crista galli have been distinguished. To them it is necessary to add calvaria No. 1, on which the described section has also been preserved. According to this, minimally 17 persons were buried in tomb No. 2.

Representation of adults and juveniles. None of the found fragments corresponds by its dimensions or robusticity to a child at the age of infans I or infans II (to 14 years). Fragment No. 15 represents, for its morphological character and gracility of the bones, probably a juvenile individual (14 to 20 years). The overwhelming majority of the other fragments belongs to adult persons. But it is not excluded that among the gracile smaller fragments, ascribed to women (No. 8 to 11), another juvenile individual may be concealed.

Proportion of men and women. According to the medial sections of the frontal bones, there are 9 adult men and at least 3, at most 7 adult women represented in the material. Further, at least 1, at most 5 juveniles individuals have to be taken into account.

Morphological features. The glabella is poorly developed in general (with men 2—3, with women, respectively juvenile individuals 1—2), the same applies for the supraorbital arches (men 1—3, women 1—2). Feable to medium developed frontal tubera exhibit in 4 out of 7 cases a tendency to merging, while in 2 cases a carina is indicated (with men). Metopismus was not present in the group under study. The profile of the frontal squama was oblique in men (in 5 cases), or their forehead was regularly vaulted (in 3 cases), while in women and in juvenile persons the forehead was most frequently vertical. In frontal bone No. 2 (male) the small breadth values and the low transversal frontal index values are striking.

3. Frontal Bone — Fragments from Lateral Parts

On all these fragments, the beginning of linea temporalis on facies temporalis is preserved. Fewer of them have been preserved than fragments from the medial parts, so that they are not suited for the determination of the minimum number of buried persons. Inasmuch a part of the coronal suture has been preserved, a rough estimate of the age of the particular individuals can be made. Unfortunately, this section did not yield sufficient data for determination of the sex.

To the left side belong fragments No. 19 to 25, while from the right side fragments No. 26 to 29. The same section also kept preserved on calvaria No. 1 (on both sides), on frontal bone No. 2 (on both sides), and on fragments No. 3 (left) and No. 7 (left).

The descriptive features and the measured thickness of the frontal squama at the frontal end of the temporali line are shown in Table 5 together with the estimates of the age of the individuals.

Estimation of age. Fragments No. 23 (left-sided) and No. 27 (right-sided) with identical characters and generally small dimensions belong apparently to one and the same individual. The other fragments from either side reciprocally exclude themselves for their morphological characters, the measured thickness of the frontal squama or the degree of obliteration of the coronal suture.

Thus we have got to do with the remains of a total of 14 persons, of whom 1 died at the age of 14 to 20 years, 3 at the age of 20 to 30 years, 1 at the age of 20 to 40 years, 3 at the age of 30 to 40 years, 1 at the age of 50 to 60 years, while for the remaining five persons only in general an adult age can be stated. Even though this determination is merely an altogether rough estimate in the light of modern knowledge about the considerable variation of the fusion of sutures of cranial convexity, it yields at least basic information that the majority of individuals died at a younger or middle age.

4. Occipital Bone — Fragments with External Occipital Protuberance

This is a very characteristic, unpaired section, formed of a relatively resistant bone with the high rate of preservation even under very adverse conditions, so that it may serve as control for the de-

TABLE 5

Descriptives features and thickness of lateral parts of frontal bones

Feature	Fragment (calvaria) No													
	1	2	3	7	19	20	21	22	23 + 27	24	25	26	28	29
Side	L	B	L	L	L	L	L	L	B	L	L	R	R	R
Linea temporalis	1	3	1	1	3	1	1	1	1	1	1	3	3	2
Obliteration of frontal suture	C_3 ±	C	C_3O	—	C_1C_3 +	O	C_3O	—	—	—	—	C_3 ±	—	C_3 ±
Thickness of squama frontalis (mm)	—	5	5	5	5	5	5	5	2	4,5	5	5	6	3
Age estimation	30–40	20–40	20–30	adult	50–60	20–30	20–30	adult	juvenile	adult	adult	30–40	adult	30–40

Explanatory notes:

Side: B — bilateral, L — left, R — right
Linea temporalis: 1 — slight, 2 — medium, 3 — strong
Obliteration of the frontal suture: 0 — no obliteration, ± — beginning of obliteration, + — finished obliteration
Thickness of squama frontalis: measured on facies temporalis 1 cm posterior of the frontotemporal point

termination of the number of individuals. It is also possible to attempt to determine the sex of the particular individuals and to estimate roughly their age.

List of fragments:

No. 31 — posterior two thirds of calva, formed of an almost complete occipital squama, a complete right parietal bone (to which adheres a small strip from the right half of the frontal bone) and the medial half of the left parietal bone
No. 32 — incomplete occipital squama
No. 33 — right half of occipital squama with adjacent medial edge of left half
No. 34 — left half of occipital squama with adjacent medial edge of right half
No. 35 — incomplete left half of occipital squama
No. 36 — transversally broad rostrocaudal narrow strip of medium part of occipital squama
No. 37 — left upper quarter of occipital squama with adjacent parts
No. 38 — right upper quarter of occipital squama with adjacent parts
No. 39 — left upper quarter of occipital squama with adjacent part of right upper quarter
No. 40 — incomplete right upper quarter of occipital squama with adjacent part of right lower quarter
No. 41 — incomplete medium third of occipital squama from left asterion to about 2 cm medially of right asterion
No. 42 — incomplete upper left quarter of occipital squama with adjacent part of lower left quarter
No. 43 — left medial sixth of occipital squama between left asterion and protuberance
No. 44 — neighbourhood of protuberance
No. 45 — neighbourhood of protuberance.

To these 15 fragments, on which the external occipital protuberance has been always preserved, it is necessary to add calvaria No. 1, on which the same section is present. To the fragments of the occipital squama is also necessary to add fragment No. 46 of squama without protuberance, which topographically excludes itself from all the described fragments, with the exception of No. 40, from which it differs convincingly by its morphology. On the other hand, another fragment No. 47, the upper part (tip) of the occipital squama may theoretically belong to various of the above listed fragments.

The descriptive features and the measured thickness of the occipital squama are summarized in Table 6, where at the same time estimates of the sex and the age of the particular individuals are given.

Calva No. 31 (Fig. 3) yields still further information. In norma lateralis runs a regularly and relatively fairly curved sagittal arch, interrupted from the lambda by a slight offset and bulge of the occipital squama; under the inion follows a slight concavity of the profile curve. In norma verticalis probably an ovoid with a little projecting parietal tubera was formed. The coronal suture and the middle part of the sagittal suture (S_{2-3}) are almost entirely obliterated, while the other sections and the lambdoid suture are open. In the lambda an inserted ossicle is present, while further minute bones are found in the lambdoid suture. In norma occipitalis the contour is on the boundary of house-like and tent-shaped forms. The side wall (preserved on the right) is convex and broadens somewhat in the downward direction. The sagittal region is fairly high, the sagittal suture lies in a slight depression. With regard to the further morphological characters (Table 6), remains of a woman, died at the age of 40 to 50 years, are involved.

The obtained metric data are given in Table 7. It is necessary to point to their similarity to the metric data of calvaria No. 1.

TABLE 6

Descriptive features and thickness of squama occipitalis

Feature	Fragment (calvaria, calva) No																
	32	33	34	35	36	41	42	44	46	1	31	37	38	39	40	45	43
Protuberantia occipitalis externa	2	2	0—1	2	2	3	1—2	2	—	1	1	0—1	0	0	0	1	1
Linea nuchae superior	3	2	2	3	3	3T	2—3	3	3	3	1	2	2	—	1	1	1
Linea nuchae inferior	—	1	2	—	—	1—2	—	—	—	2	1	—	—	—	1	—	—
Protrusion of upper part of squama	3	3	3	1	1	3	2	1—2	1	1	3	2	2	1	1	1	1
Maximum thickness on protuberance (mm)	12	16	16	15	17	15?	16	17	—	—	12	10	11	12	13	12	8,5
Minimum thickness of upper part of squama	5/5	–/5	6/–	5/–	5/6	5/5	5/–	–/5	6/–	—	4/4	4/–	–/5	5/5	–/5	6/6	4/–
Lambdoid suture obliteration	L_3O	$L_{2-3}O$	LO	$L_{1-2}O$	L_2O	L_3O	L_2O	—	$L_{1-2}O$	LO	LO	$L_{1-2}O$	$L_{1-2}O$	$L_{1-2}O$	$L_{1-2}O$	—	$L_{2-3}O$
Sulcus sagittalis falls into sinus transversus	R	R	B	L	R	R	R	R	L	L	R	L	R	L	R	B	L
Probable sex	M	M	M	M	M	M	M	M	M	F	F	F?	F	F	F	F	?
Probable age	< 60	< 50	< 50	< 50	< 50	< 60	< 50	adult	< 50	30—40	40—50	< 50 (juv?)	< 50	< 50	< 50	adult	juve-nile

Explanatory notes:

Protuberantia occipitalis externa: according to Broca's classification (Martin 1928)
Linea nuchae superior and inferior: 1 — feeble, 2 — middle, 3 — strong, T — torus occipitalis
Protrusion of the upper part of the squama: 1 — slight, 2 — medium, 3 — strong
Minimum thickness of upper part of squama: measured about 2 cm laterally from the mid-line and about 2 cm above sulcus transversus, left/right
Lambdoid suture obliteration: 0 — no obliteration, ± — beginning of obliteration, + — finished obliteration
Sulcus sagittalis falls into sulcus transversus: R — to the right, L — to the left, B — to both sides (bifurcation)
Probable sex: M — male, F — female, ? — undetermined

TABLE 7

Metric features of Calva No. 31 (adult female)

Dimensions (in mm)	
Maximum breadth of occipital bone (12)	106 ?
Sagittal parietal curve (27)	127
Sagittal occipital curve (28)	106 ?
Sagittal parietal cord (30)	110
Sagittal occipital cord (31)	93 ?
Indices	
Parietal curve index (I 24)	86.6
Occipital curve index (I 25)	87.7 ?
Breadth-length index of squama occipitalis (I 29)	87.7 ?

Pathological finding. On fragment No. 32 (adult male), over the ridge-like right half of linea nuchae superior, healed splitting off of the compacta in a roughly oval shape with a longer axis running obliquely from right top to left bottom (19 × 9 mm, maximum depth 3 mm) can be seen. The edges of the defect are somewhat uneven in the medial part, while everywhere else the surface is smooth and diploë is not evident. This are obviously traces of a wound caused by stabbing, probably with a chisel-shaped instrument.

Number of individuals. In the material a total of 14 fragments of occipital bone with protuberance, a further fragment No. 46, differing topographically or morphologically from the others, calvaria No. 1 and calva No. 31 including portions with protuberance, could be distinguished.

Estimation of age. In all adult individuals except for two it was possible to state that they had died at the age below 50 (respectively 60) years. This supports the conclusion on the younger to middle age of the individuals, expressed above. Next to an undoubtedly juvenile individual, represented by fragment No. 43, it would be possible to admit a juvenile age also in the probable woman represented by fragment No. 37.

Proportion of men and women. Just as in the analysis of the remains of the medial parts of the frontal bone we get 9 men and 7 women, of whom, however, one might also be a juvenile individual.

Morphological characters. The external occipital protuberance is generally only very poorly developed (in men 0—1 to 2, exceptionally 3, in women and a juvenile individual 0 to 1). Linea nuchae superior in men is medium to strong, while in women feeble to medium, exceptionally also strong. Linea nuchae inferior, which kept preserved on a smaller number of fragments, was generally very poorly developed. The degree of projection of the upper part of the occipital squama varies from insignifant to considerable without sex difference. In the greatest thickness in the region of protuberance, respectively of the crucial eminence, a difference between the distinctly higher values for men, compared with the values for women and a juvenile individual, can be noticed. In the smallest thickness of the upper part of the occipital squama, this difference is less visible. Of the 16 evaluated cases, sinus sagittalis continues 9 times to the right-sided, 5 times to the left-sided sinus transversus, and in 2 cases a bifurcation with ostia on both sides is formed.

5. Temporal Bone — Fragments with Mastoid Region

A total of 15 fragments with right-sided and 9 fragments with left-sided mastoid regions were found. To determine the number of individuals and the proportion of the two sexes, the fragments from the right side are thus more suitable. The latter's number approximates the minimum number established according to the medial part of the frontal bone and according to the occipital bone.

List of fragments from the right side:

No. 48 — pars petrosa with the largest part of pars tympanica and the rear part of pars squamosa
No. 49 — regio mastoidea with the nearest neighbourhood
No. 50 — regio mastoidea with the nearest neighbourhood
No. 51 — regio mastoidea (without apex of mastoid process), outer half od pyramid, lower part of squama temporalis, pars tympanica
No. 52 — regio mastoidea without rear edge, outer part of pyramid, lower edge of squama temporalis
No. 53 — regio mastoidea (without apex of mastoid process), outer part of pyramid, lower edge of squama temporalis
No. 54 — incomplete pars petrosa with lower part of squama temporalis
No. 55 — regio mastoidea with adjoining lower part of squama temporalis
No. 56 — regio mastoidea
No. 57 — regio mastoidea (without apex of mastoid process), outer half of pyramid, pars tympanica and lower part of squama temporalis
No. 58 — regio mastoidea (without apex of mastoid process), outer half of pyramid, pars tympanica and lower part of squama temporalis
No. 59 — base of processus mastoideus with nearest neighbourhood
No. 60 — base of processus mastoideus with incomplete pyramid and lower edge of squama temporalis
No. 61 — fragment of rear third of processus mastoideus
No. 62 — fragment of rear quarter of processus mastoideus

List of fragments from the left side:

No. 63 — incomplete pars petrosa (processus mastoideus without apex) and lower half of squama temporalis

No. 64 — regio mastoidea (without apex of mastoid process) with nearest neighbourhood
No. 65 — incomplete pars petrosa
No. 66 — regio mastoidea, pars tympanica, lower part of squama temporalis
No. 67 — regio mastoidea (with partly broken-off mastoid process) with nearest neighbourhood
No. 68 — incomplete pars petrosa (with partly broken-off mastoid process), pars tympanica and lower part of squama temporalis
No. 69 — regio mastoidea and beginning of processus zygomaticus
No. 70 — incomplete pars petrosa
No. 71 — base of processus mastoideus with lower edge of squama temporalis.

To these fragments it is necessary to add calvaria No. 1, where both mastoid regions are preserved.

Descriptive features and dimensions of the fragments of the mastoid region have been compiled in Table 8 (right-sided fragments) and Table 9 (left-sided fragments) together with the estimation of the sex of the individuals.

Number of individuals. 15 right-sided fragments with regio mastoidea together with calvaria No. 1, on which the same section is preserved, represent a total of 16 individuals. From the left side remains of only 10 persons are preserved.

Estimation of age. Among the fragments from the right and the left side are found remains of one juvenile person. It is not excluded that another juvenile individul is hidden in 2 of the 4 right-sided fragments of undetermined sex. All the other fragments represent adult persons.

Proportion of men and women. 5 right-sided and 2 left-sided fragments belong probably to men, 6 fragments from both sides (including the calvaria) to women, another 4 right-sided fragments and 1 left-sided fragment could not be determined for lack of criteria.

Morphological characters. In men the mastoid process is medium-long to long, me-

TABLE 8

Descriptive features and thickness of regio mastoidea dextra

Feature	Fragment (calvaria) No															
	48	49	50	55	58	1	51	52	53	54	56	57	59	61	62	60
Size of processus mastoideus	3	2	3	2	—	2	—	—	—	1	2	—	—	—	—	—
Circumference of processus mastoideus	3	2	2	2—3	2—3	1—2	1	1—2	1—2	1	1	2	2	—	—	1
Incisura mastoidea	1	2—3	3	2	—	1—2	2	—	1—2	3	2	—	2	2—3	—	1
Crista supra-mastoidea	1	2	2	3	3	2	1	2	1	3	1	3	2	—	—	1
Traces of sutures on processus mastoideus	±	0	+	+	0	—	0	0	0	+	0	0	0	—	—	0
Robusticity of bone	2—3	3	3	2—3	2—3	1—2	2	2	2	2	2	2	2—3	2?	2	1—2
Thickness of processus mastoideus (mm)	20	16	16	14	16	16	11	14	13	10	9	14	—	—	—	12
Length of processus mastoideus (mm)	30	26	32	—	—	28	—	—	—	26	24	—	—	—	—	—
Probable sex	M	M	M	M?	M	F	F	F	F	F	F	?	?	?	?	?
Probable age	adult													adult or juvenile		juvenile

Explanatory notes:

Size of processus mastoideus: 1 — small, 2 — medium, 3 — long
Circumference of processus mastoideus: 1 — small, 2 — medium, 3 — large
Incisura mastoidea: 1 — small (shallow or narrow), 2 — medium, 3 — large (deep or wide)
Crista supramastoidea: 1 — slight, 2 — medium, 3 — outstanding
Traces of sutures on processus mastoideus: 0 — no, ± — slight, + — fair
Robusticity of bone: 1 — gracile, 2 — medium, 3 — robust
Thickness of processus mastoideus: measured in the direction of the axis of the pyramid between the bottom of incisura mastoidea and the lateral side of the base of processus mastoideus
Length of processus mastoideus: projective distance between the apex of processus mastoideus and the horizontal level determined by the porion
Probable sex: M — male, F — female, ? — undetermined

TABLE 9

Descriptive features and thickness of regio mastoidea sinistra

Feature	Fragment (calvaria) No									
	63	67	1	64	65	68	69	70	71	66
Size of processus mastoideus	—	2—3	2	—	—	1—2	1—2	1	—	1
Circumference of processus mastoideus	3	2	2	1	1	1—2	2	1—2	—	1
Incisura mastoidea	1	—	2—3	2	2—3	1—2?	2	2	—	2
Crista supramastoidea	2	2—3	2	1	—	2—3	1	—	1—2	2
Traces of sutures on processus mastoideus	±	+	—	+	0	0	0	0	—	±
Robusticity of bone	2—3	3	1—2	2	2	2	2	1—2	2	1—2
Thickness of processus mastoideus (mm)	21	15	13	12	12	14	11	11	—	11
Length of processus mastoideus (mm)	—	30	27	—	—	—	—	26	—	18
Probable sex	M	M	F	F	F	F	F	F	?	?
Probable age	adult									juvenile

Explanatory notes:
see Table 8!

dium to very voluminous, while in women short to medium-long, little to medium voluminous. The mastoid incisure is very variable in both sexes. Crista supramastoidea reaches in men a mediocre to strong expression, whereas in women slight to medium, exceptions, however, existing. Out of 13 evaluated cases from the right side, only in 3 cases distinct and in another case weak traces of a suture on the outer side of the mastoid process were left, while in 8 cases from the left side twice weak and twice distinct traces of a suture were preserved. The robusticity of the bones is medium to great in males, while in females it is most frequently medium. The thickness of the mastoid process varies in men from 14 to 21 mm, while in women from 9 to 16 mm. A difference is also to be seen in the length of the mastoid, where, however, only few data are available. In men it makes 26 to 32 mm, in women 24 to 28 mm, and in a juvenile individual 18 mm.

6. Other Fragments from Calvarium

In the material another 154 non-characteristic fragments of bones from the vault of the skull and 4 fragments from the base of the skull, from the neighbourhood of foramen occipitale magnum, have been distinguished. No fragments from the facial parts of the skulls have been preserved, which indicates possible intentional destruction of the remains with the view to destroy even the figure of the deceased. This circumstance does not permit to determine in detail the anthropological type of the buried population group.

Fragments from Mandibles

A total of 30 fragments from mandibles have been preserved. For cutting short their wordy description, they are graphically illustrated in Fig. 1. The criterion of the degree of preservation is, on the one hand, the lower margin (base) of the mandible, on the other hand, the individual alveoli. The selection of some fragments is demonstrated in norma lateralis and norma verticalis in Fig. 4.

The degree of preservation can be determined according to the number of the preserved sections of the mandibles (lower row of Fig. 1). Most frequently have been preserved the frontal section and the region of the left premolars (from right C to left P_2), this happening in 14 to 17 cases. Next follows the region of the left molars (13 to 14 cases), the right lateral region (10 to 11 cases), the left ramus mandibulae (10 cases), and the right ramus mandibulae (8 cases). It is to be seen that the sections from the left half of the mandible have been preserved more frequently than those from the right half. Fig. 1 also tells us that a predilected site of breaks on the mandible is the area of the second incisor and canine (left 12 x, right 6 x) and the transition between body and ramus (left 10 x, right 6 x). This would correspond to intentional destruction (trampling) of the bones.

TABLE 10

Descriptive features of mandibular fragments

Feature	Basic fragment No									Adjoining fragment No			
	1	24	9	10	11	12	16	18	19	3	7	8	28
Protuberantia mentis	2	—	1–2	3§	2	2	1–2	1	—	—	—	2	—
Tubercula mentalia	3*	—	3	3	3	3	2–3	3	—	—	—	3	—
Symphyseal height	2–3	—	2–3	1§	2	2	2	2–3	2?	—	—	3	—
General dimensions	2	2	2	1§	2	2	2	2	2	2	2	3	—
General robusticity	2	2	2	2§	2	2	2	2	2–3	2	2	3	—
Outer muscular relief	3	3	—	—	—	—	—	3	—	3	—	3?	2–3
Eversion of mandibular angle	0	1	—	—	—	—	—	3	—	3	—	—	1
Inner muscular relief	3	3	3	—	—	—	—	3	—	3	—	3?	3
Spina mentalis	2	—	3	2–3	3	2–3	2–3	0	—	—	—	—	—
Fossa digastrica	2	—	3	2	3	1	1	3	—	—	—	1	—
Angulus mandibulae	2	2	—	—	—	—	—	3	—	1	—	—	—
Ramus mandibulae	2b	2b	—	—	—	—	—	—	—	2b–c	—	—	—
Incisura mandibulae	1	1	—	—	—	—	—	—	—	2–3?	—	—	—
Atrophy of pars alveolaris	0	P	0	W	0	0	0	W	0	0	0	0	0
Probable sex	M		M	M	M	M	M	M	M?	M?	M?	M	M?
Probable age	adult			>30	adult			>30	adult	adult			

Feature	Basic fragment No									Adjoining fragment No						Basic fragment No	
	6	13	23	14	20	15	17	21	22	2	4	5	25	29	27	26	30
Protuberantia mentis	—	3	—	3	—	3	3	3?	—	—	—	—	—	—	—	—	—
Tubercula mentalia	1	0	—	—	—	0	0	0	—	—	—	—	—	—	—	—	—
Symphyseal height	1	1	—	2	—	1	1–2	1	—	—	—	—	—	—	—	—	—
General dimensions	1	1	1	2	2	1	2–3	1	2	2	1	1	2	2	1	1§	2
General robusticity	1	2	2	2	2	2	2	2	2	—	1	1	2	2	1	2§	2
Outer musculer relief	1?	—	1–2	—	—	—	—	—	—	1–2	3	—	1	1–2	1	—	—
Eversion of mandibular angle	—	—	0?	—	—	—	—	—	—	0	1	—	—	—	0	—	—
Inner muscular relief	1	—	1–2	—	—	—	—	2	2–3	1–2	2–3	—	1–2	1–2	1–2	—	—
Spina mentalis	1	3	—	1	—	3	3	—	—	—	—	—	—	—	—	—	—
Fossa digastrica	2	1	—	1	—	0–1	2	3	—	—	—	—	—	—	—	—	—
Angulus mandibulae	—	—	—	—	—	—	—	—	1	—	3	1?	3?	3	1	—	—
Ramus mandibulae	—	—	—	—	—	—	—	—	—	—	2a–b	2	—	3b	—	—	—
Incisura mandibulae	—	—	—	—	—	—	—	—	—	—	2	—	—	1	—	—	—
Atrophy of pars alveolaris	P	0	0	0	P	0	P	P	0	0	0	0	0	0	0	W	—
Probable sex	F	F		F?		F	F?	F	F?	F?	F?	F?	F?		F	?	?
Probable age	adult			>30		adult or juvenile	adult	>30	adult	adult or juvenile	adult					>30	?

Explanatory notes:

Protuberantia mentis: 1 — slight, 2 — medium, 3 — outstanding, § — changed by atrophy
Tubercula mentalia: 1 — small, 2 — medium, 3 — expressive, * — cornice
Symphyseal height: 1 — small, 2 — medium, 3 — great, § — changed by atrophy
General dimensions: 1 — small, 2 — medium, 3 — great, § — changed by atrophy
General robusticity: 1 — gracile, 2 — medium, 3 — robust, § — changed by atrophy
Outer muscular relief: 1 — slight, 2 — medium, 3 — expressive
Eversion of mandibular angle: 0 — not present, 1 — slight, 2 — medium, 3 — outstanding
Inner muscular relief: 1 — slight, 2 — medium, 3 — expressive
Spina mentalis: 1 — low, 2 — medium, 3 — high
Fossa digastrica: 1 — slight, 2 — medium, 3 — expressive
Angulus mandibulae: 1 — nearly right angle, 2 — medium, 3 — oblique
Ramus mandibulae: 1 — low, 2 — medium, 3 — high, a — narrow, b — medium, c — wide
Incisura mandibulae: 1 — shallow, 2 — medium, 3 — deep
Atrophy of pars alveolaris: 0 — not present, P — partially, W — wholly
Probable sex: M — male, F — female, ? — undetermined

TABLE 11

Metric features of mandibular fragments

Feature or index	Basic fragment No									Adjoining fragment No		
	1	24	9	10	11	12	16	18	19	3	7	8
Symphyseal height (69)	—	—	32	19§	30?	29	—	—	—	—	—	35
Height of body at the level of foramen mentale (69,1)	33·	35	—	18§	31	—	31	33	31	—	—	37
Thickness of body at the same level (69,3)	10·	11	11	11§	11	—	11	11	14	—	12	12
Height of body at the level of M_2 (69,2)	30·	28§	—	15§	—	—	—	25§	31	—	—	34
Thickness of body at the same level (—)	15·	12§	—	11§	—	—	—	12§	15	—	14	13
Height of ascending ramus (70)	—	—	—	—	—	—	—	—	—	—	—	—
Minimum breadth of ascending ramus (71)	32·	33	—	—	—	—	—	32	—	35	—	—
Thickness of mandibular body index at the level of foramen mentale (I 66)	30.3·	31.4	—	61.1§	35.5	—	35.5?	33.4?	45.2	—	—	32.4
Thickness of mandibular body index at the level of M_2 (—)	50.0·	42.9§	—	73.3§	—	—	—	48.0§	48.4	—	—	38.2
Ascending ramus index (I 63)	—	—	—	—	—	—	—	—	—	—	—	—
Probable sex	M		M	M	M	M	M	M	M?	M?	M?	M

Feature or index	Basic fragment No									Adjoining fragment No					Basic fragment No
	6	13	23	14	20	15	17	21	22	2	4	25	29	27	26
Symphyseal height (69)	—	27?	—	29?	—	25?	28?	—	—	—	—	—	—	—	—
Height of body at the level of foramen mentale (69,1)	25?	—	—	—	29	27?	32	27?	28	30	—	—	—	—	26?
Thickness of body at the same level (69,3)	10	—	—	—	14	12	12	12	11	12	—	—	—	—	13
Height of body at the level of M_2 (69,2)	23	—	26	—	29	—	28	24§	28	27	25?	27	—	24	20§
Thickness of body at the same level (—)	12	—	13	—	15	—	13	13§	14	15	—	14	—	11	15§
Heigh of ascending ramus (70)	—	—	—	—	—	—	—	—	—	—	55	—	60	—	—
Minimum breadth of ascending ramus (71)	—	—	—	—	—	—	—	—	—	—	31	34?	32	—	—
Thickness of mandibular body index at the level of foramen mentale (I 66)	40.0§	—	—	—	48.3	44.4?	37.5	44.4?	39.3	40.0	—	—	—	—	50.0§
Thickness of mandibular body index at the level of M_2 (—)	52.2	—	50.0	—	51.7	—	46.4	54.2§	50.0	55.6	—	51.9	—	45.9	75.0§
Ascending ramus index (I 63)	—	—	—	—	—	—	—	—	—	—	56.3	—	53.3	—	—
Probable sex	F	F		F?		F	F?	F	F?	F?	F?	F?		F?	?

Explanatory notes:
All metric values are given in millimetres
§ — changed by atrophy of the alveolar part
• — measured on the right side

Only exceptionally torsos of teeth remained in the alveoli; for the most part only remains of roots stuck in them.

The number of individuals can be determined on the basis of the section that kept preserved most frequently and the mandibles with this section can then be regarded as representatives of the particular individuals. Most frequently kept preserved the sections with I_2 and C on the left side, altogether in 17 cases, which corresponds to the minimum number of individuals, determined according to the frontal and occipital bones. Fig. 1 also tells us that in 14 fragments both section with I_2 and section with C are present. In another fragment (No. 1) only section with I_2 is preserved, in fragments No. 13 and No. 14 section with I_2 with an incomplete right half of section with C. On the other hand, there exist fragments No. 20, 23 and 24 that begin with the left half of section with C. Although an anatomical association is absent, the probable assumption can be expressed, from the morphological point, of view that fragments 1 and 24 (male), 13 and 23 (female), and 14 and 20 (female ?), respectively, belong to the same individual.

From these remains, which we can regard as "basic", another 7 fragments from the right side of the mandible and 3 fragments from the left side of the mandible, which can be denoted as "adjoining" fragments, do not exclude one another. With regard to the fact that communicating sections are missing, it is not possible to determine with certainty the original mutual connection of the basic and adjoining fragments. From the morphological aspect it is only probable that the marginal fragments No. 25 and 29 belong to one individual (female ?).

Descriptive features, together with the estimation of the sex and the age are summarized in Table 10. The measured values are given in Table 11.

Proportion of men and women. In the basic fragments a total of 8 probable men, 7 women, and two individuals of undefinable sex could be distinguished.

Estimation of age. In most basic fragments it was possible to state a simple adult age, in 2 men and 2 women and 1 individual of undefinable sex owing to the great losses in the denture with atrophy of the alveolar processes an age over 30 years, in one women (?) an adult or juvenile age, and in another individual of undefinable sex not even the age could be determined.

Morphological characters. Protuberantia mentis in men is weak to medium, while in women mostly very marked. Tubercula mentalia are distinct in men, whereas they are absent, as a rule, in women. Men display a symphysal height and the other height dimensions of the body of the mandible greater than women. In the overall dimensions and in the general robusticity, estmated for the most part, as medium, we cannot observe clear difference between the sexes. Owing to the greater height of the mandible body in men, with almost the same thickness as in women, we may observe in men mostly lower height-thickness index values than in women (the values influenced by atrophy not being taken into consideration). The outer and the inner muscular relief is markedly developed in men, while in women it is weak to medium. Only in men do we find some tendency to a more marked eversion of angles. Spina mentalis in men is medium to high, whereas in women low or high. The same wide variation is displayed in both sexes by fossa digastrica and the angle of mandible. The ramus mandible is, for the most part, higher and medium-broad.

Pathology of the dentition. Fig. 1 shows which of the alveoli has been preserved without pathological changes and which as a result of intravital loss of teeth were in partial or complete obliteration. A resultant picture according to the individual types of teeth is presented in Table 12. Owing to the small number of individuals, no attention was paid to the sex and laterality.

TABLE 12

Number of teeth lost intra vitam

Tooth	Number of preserved alveoli	Number of teeth lost intra vitam	Percentage of teeth lost intra vitam
I_1	19	6	31.6
I_2	22	6	27.3
C	26	4	15.4
P_1	20	3	15.0
P_2	21	2	9.5
M_1	23	7	30.4
M_2	23	7	30.4
M_3	22	4	18.2
All teeth	176	39	22.2

The percentage of intravital losses of teeth varies between 9.5 % (P_2) and 31.6 % (I_1), the total average for the group under study making 22.2 %. Of surprise is not only the relative high intensity but, also the distribution of intravital losses per individual types of teeth. Mostly affected are both incisors and the first and second molars, less the third molar, the canine and the first premolar, least the second premolar. The percentage of afflicted inicisors and the first two molars is almost identical.

Owing to the fact that with the exception of some torsos no tooth crowns are preserved, it is not possible to treat the question of the decay rate of the denture as cause of these unusually frequent losses of teeth in persons who had reached only a middle or younger age. From a comparative study on the paleopathology of dentition in the prehistorie and historic periods (Strouhal, 1961, 1964) we recall that dental caries and also intravial losses affected in the pre-Roman times primarily the region of molars, while the frontal teeth were spared for a long time. Only with the advance of a re-

fined mode of life in the Roman Empire did the rate of decay of the frontal teeth increase.

Our samples are dated to the New Kingdom period. Even though in Egypt of those times the denture displayed a higher degree of decay than in other regions (Ruffer, 1920), we cannot assume that the population living in far-away Nubia led a richer way of life than the leading classes in administrative centres. The cause of the frequent intravital losses with massive affliction of the frontal sections is rather to be sought in the possible occurrence of paradontopathy. Badly preserved alveolar margins of most fragments, unfortunately, did not permit to follow this question in detail. Only on fragment No. 20 tuberouse outgrowths and strongly honeycomblike margins of the alveoli were found on the occlusal and internal sides of the alveolar process in the region of the molars. Strong atrophy of the alveolar margin of some other fragments (No. 10, 18, 26) could also be posssible consequence of paradental disease.

Fragments from Trunk Bones

1. *Vertebrae*

Preserved remained incomplete 3 atlases, 1 epistropheus (frontal height of body with dens epistrophei 35 mm), and 5 other cervical vertebrae. None displayes any traces of fusion of the apophyses on body and no pathological changes either.

Of the thoracic vertebrae, 23 show major parts of the body margins, according to which it can be proved that they are without traces of fusion as well as without pathological changes. Another 8 vertebrae bear spondylotic outgrowths, 2 of which being very long and broad, while 2 vertebrae are joined by outgrowths into one block (Fig. 5).

In the remaining 9 fragments it was not possible to ascertain the condition because of severe damage.

Of the lumbar vertebrae, 15 are without pathological changes. On one of them, traces of sutures have been preserved, another one has no apophyses grown together. Six other vertebrae were affected by osteophytes, 3 of them being long to extremely long (Fig. 5).

2. *Sacrum*

Out of a total of 18 found fragments, in 7 of them areas were preserved that may contribute to our study. The obtained data are summarized in Table 13.

The remains of the sacrum prove the presence of 2 individuals younger than 18 years and 1 individual younger than 22 years. Fragment No. 7, with a determined age of under 25 years, could theoretically belong to the same individual as fragment No. 4.

3. *Other Fragments*

In addition, 19 fragments of ribs, which are no suitable material for the goals of this study, are preserved.

TABLE 13

Descriptive features and breadth of sacrum

Feature	Fragment No 1	2	3	4	5	6	7
Preserved area	S_{1-5}	S_{1-3}	S_{1-4}	S_3	S_{4-5}	S_{3-5}	S_1
Basality	H	H	H	—	—	—	—
Opened sutures between	O	$S_{1/2}$ $S_{2/3}$	$S_{1/2}$ S_{2-3} S_{3-4}	$S_{2/3}$ $S_{3/4}$	O	O	$S_{1/2}$
Upper anterior breadth (mm)	—	94	—	—	—	—	—
Spina biffida under	S_4	—	—	—	S^4	S^4	—
Probable age	> 30	< 22	< 18	< 18	adult		< 25

Explanatory note:
Basality: H-hypobasal

Fragments from the System of Upper Extremity

1. *Scapula*

Preserved are 9 fragments from the right and 6 fragments from the left scapula and another 5 undeterminable pieces. On the right-sided fragment No. 14, fossa glenoidalis contoured by an osteophytic border of 2 mm width and 1—2 mm thickness was found. The fragments from the scapula are not suited for further study.

2. *Clavicula*

Preserved are a total of 9 fragments, namely 6 from the left side and 3 from the right side.

Metric features. The circumference of the centre of diaphysis (6) was found on the left side to be 30 mm (woman) and 41 mm and 42 mm (both men), while on the right 35 mm and 36 mm (both individuals of undeterminable sex) and 39 mm (man ?).

No. 9 (rear area of inner half of right clavicula) there is a pair of closely merging crater pits (transversal width 16 mm, height 9 mm, depth 3—4 mm) on the lower surface of the bone, 11 mm from its medial margin (fossa costoclavicularis). They have sharp edges, the bottom being formed of roughened spongiosa. They are most probably traces of a chronic inflammatory process.

3. *Humerus*

Preservation degree. Available are only one complete right humerus (No. 4), 3 bigger and 9 smaller fragments of proximal epiphysis, 11 fragments from the right and 12 fragments from the left distal epiphysis, 8 larger and 12 smaller fragments from diaphysis. Humerus No. 4 according to the weak to medium robusticity and muscular re-

TABLE 14

Metric features of humerus fragments (in mm)

Feature	Fragment No																				
	2+	3+	5§	6§	9§	15§	28·	30·	35·	1+	16§	17§	18§	19§	29·	31·	4″	7§	8§	20§	25§	32·	33·	34·
Side:	RIGHT									LEFT							RIGHT			LEFT				
Maximum length (1)	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	292	—	—	—	—	—	—	—
Whole length (2)	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	288	—	—	—	—	—	—	—
Minimum circumference of diaphysis (7)	—	—	—	62	65	67	61	62	66	—	62	63	—	—	61	61	59	49	—	—	—	47	55	56
Circumference of caput (8)	139	157	—	—	—	—	—	—		140	—	—	—	—	—	—	124	—	—	—	—	—	—	—
Breadth of trochlea (11)	—	—	62	64	—	—	—	—		—	65	—	64	61	—	—	55	50	56?	57	51	—	—	—
Index of robusticity (7 : 1)	—	—	—	—	—	—	—	—		—	—	—	—	—	—	—	20.2	—	—	—	—	—	—	—
Probable sex	M?	M	M	M	M	M	M?	M	M	M?	M	M	M	M?	M?	M?	F	F	F?	F?	F	F	F?	F?

Explanatory notes:
+ — fragment of proximal epiphysis
§ — fragment of distal epiphysis
· — fragment of diaphysis
″ — complete humerus

lief, metrics and absence of traces of epiphysary junction belonged to an adult woman.

Metric features. Together with the data on the probable sex, basing also on the general robusticity, these features are summarized in Table 14. The greatest length of humerus No. 4 is medium and according to the table of Trotter-Gleser (1952) in women of the white race corresponds to a stature of 156 cm. The robusticity index is relatively high.

Descriptive features. Perforation of fossa coronoidea was not found in men (3 sections from the right, 4 sections from the left humerus), but was found in women (1 case out of 3 right, 2 cases out of 3 left humerus fragments), and in individuals of undeterminable sex (0 case of 3 right, 2 cases of 5 left ones). The total frequency independent of the sex and laterality reaches 23.8 %.

Not in a single case were traces of epiphysary junction found on 24 preserved sections from the distal epiphysis, so that all the remains belong to adult individuals.

Number of individuals and proportion of men and women. According to the right-sided fragments of the distal epiphyses and the whole humerus No. 4, twelve individuals are represented in the set, 4 of them being men, 3 women, and 5 individuals of undeterminable sex. According to the left-sided fragments of the distal epiphyses, twelve individuals are also concerned, 4 of them being men, 3 women,*) and 5 individuals of undeterminable sex. For the negligible dimensions and the damage to the fragments it cannot be reliably ascertained which remains from both sides belong together and which do not.

*) Besides the fragments given in Tab. 14 also the unmeasurable fragment No. 26.

4. *Radius*

Preserved are a total of 7 fragments from the proximal epiphysis (1 left, 5 right, 1 from an undeterminable side), 4 fragments from the distal epiphysis (2 left, 2 right), 3 larger (right) fragments from diaphysis and 3 small fragments from diaphysis (the side being questionable).

Metric features are summarized in Table 15.

TABLE 15

Metric features of radius fragments (in mm)

Feature	Fragment No						
	10	11	14	12	13	8	9
Side:	RIGHT			RIGHT		LEFT	
Minimum circumference (3)	—	—	46	36	33	—	—
Breadth of distal epiphysis (5, 6)	33?	33?	—	—	—	31	31
Probable sex	M?	M?	M	F?	F	F?	F?

Descriptive features. Crista interossea was expanded 3× only insignificantly (2 men ?, 1 woman?), 1× moderately (woman), and 1× markedly (man).

Insignificant traces of a grown together suture in incisura ulnaris were found in 3 of 4 fragments from the distal epiphysis. These traces are a current finding long into adultness.

Tuberositas radii of fragment No. 3 is elongated in the radial direction into an osteophytic outgrowth.

For the determination of the number of individuals and the sex ratio, the remains of the radius do not suffice.

5. *Ulna*

Preservation degree. Preserved are 11 fragments with right and 6 fragments with left proximal epiphysis, and 1 fragment with right distal epiphysis. Small fragments from diaphysis were omitted.

Metric features. Only the smallest circumference of ulna (3) in the right-sided fragment No. 19 (36 mm) and the left-sided diaphysis No. 7 (39 mm) could be measured. In either case, a male ulna is probably involved. Diaphysis No. 7 moreover, appears aspectively relatively short.

Descriptive features. The expansion of crista interossea was found to be very marked in 2 of 6 preserved right sections (men ?) and in one preserved left section (man).

On no fragment from the distal epiphysis were any traces of sutures to be seen.

Number of individuals and proportion of men and women. According to the right-sided fragments with left proximal epiphysis, 11 individuals were present. By a very approximate estimation according to the overall robusticity and the development of the muscular relief they can be divided into 6 men, 4 women, and 1 individual of undeterminable sex.

Fragments from the System of Lower Extremity

1. *Os Coxae — Fragments from Neighbourhood of Acetabulum*

Of 20 from the right and 24 from the left side are study most suitable proved to be the fragments from the neighbourhood of the acetabulum. A total of 20 from the right and 24 from the left side are preserved.

Their descriptive features and the biggest diameter of acetabulum data and records for determining the sex and the age are summarized in Tables 16 and 17.

Number of individuals and proportion of men and women. Since some of the fragments do not exclude one another, without it being possible for the absence of communicating parts to prove their connection, we have tackled the determination of the number of individuals on the basis of two independent criteria. On the one hand, it is the presence of the upper margin of the muscular relief on the outer surface of ramus superior

TABLE 16

Descriptive features and acetabulum diameter of right coxae fragments

Feature	Fragment No																			
	24	25	26	28	33	34	35	36	37	40	23	27	29	32	30	31	38	39	41	44
Robusticity of bone	3	2–3	3	3	2–3	3	3	2–3	3	3	2	2	2	2	2	2–3	2–3	2–3	2	2–3
Depth of incisura ischiadica maior	2?	—	2–3?	—	3	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Acetabulum diameter (*mm*)	*56*	*56*	3	2–3?	3	3	3	3	3	2–3	*45*	1–2?	1–2?	—	2–3?	—	2–3	2?	—	—
Muscular relief on ramus superior ossis ischii	3	2–3	3	3	—	—	—	—	—	—	2	1–2	1–2	2	2?	2–3	—	—	—	2
Traces of sutures on ramus superior ossis ischii	0	0	0	0	—	—	—	—	—	—	0	+	0	0	0	0	—	—	—	0
Upper end of ramus superior ossis ischii preserved	+	+	+	+	—	—	—	—	—	—	+	+	+	+	+	+	—	—	—	+
Spina ilica anterior inferior preserved	+	+	+	—	+	+	+	+	+	+	+	—	—	—	—	—	+	+	+	—
Probable sex	M	M	M	M	M	M	M	M?	M?	M?	F	F	F	F?	?	?	?	?	?	?
Probable age	adult										25–30		adult					adult?		

Explanatory notes:

Robusticity of bone: 1 — gracile, 2 — medium, 3 — robust
Depth of incisura ischiadica maior: 1 — shallow, 2 — medium, 3 — deep
Acetabulum diameter indicated either in *mm* or: 1 — small, 2 — medium, 3 — large
Muscular relief: 1 — feeble, 2 — medium, 3 — strong
Traces of sutures: 0 — not present, + — present
Upper end of ramus superior ossis ischii preserved: + yes, — no
Spina ilica anterior inferior preserved: + yes, — no

TABLE 17

Descriptive features and acetabulum diameter of left coxae fragments

Feature	Fragment No																					
	1	2	3	4	6	7	9	10	15	17	19	5	11	13	14	16	18	20	8	12	21	22	42	43
Robusticity of bone	3	3	3	3	3	3	3	3	2–3	3	3	2	2	1–2	2	2	2	1–2	2–3	2	2–3	2–3	2–3	3
Depth of incisura ischiadica maior	3	3	—	—	—	—	—	—	3	—	—	—	—	—	—	1	—	—	—	—	—	—	2–3?	—
Acetabulum diameter (*mm*)	*55*	*53*	*54?*	*51*	3?	3?	3?	3?	3	3?	3	*45*	1–2?	1?	1?	*48?*	2?	—	3?	2?	3?	—	—	2–3
Muscular relief on ramus superior ossis ischii	3	3?	3	3	3	3	3	3	—	—	—	—	1	1	1	—	—	—	2–3?	—	—	—	—	—
Traces of sutures on ramus superior ossis ischii	0	0	0	0	0	0	+	0	—	—	—	0	+	0	0	—	—	—	0	0	—	—	—	—
Upper end of ramus superior ossis ischii preserved	+	+	+	+	+	+	+	+	—	—	—	+	+	+	+	—	—	—	+	+	—	—	—	—
Spina ilica anterior interior preserved	+	+	+	+	—	—	—	—	+	+	+	+	—	—	—	+	+	+	—	—	+	+	+	+
Probable sex	M	M	M	M	M	M	M	M	M?	M?	M?	F	F	F	F	F?	F?	F?	?	?	?	?	?	?
Probable age	adult						25–30	adult				25–30	adult					adult or juvenile	adult	adult?				

Explanatory notes:
see Table 16!

ossis ischii, on the other hand, the presence of spina ilica anterior inferior. According to the first criterion, 11 individuals, 4 of whom were probably men, 4 women, and 3 of undeterminable sex were represented in the fragments from the right side, while in the fragments from the left side there were 14 individuals, 8 of them being men, 4 women, and 2 of questionable sex. According to the second criterion we can distinguish in the fragments from the right side 13 persons, 9 of them being men, 1 woman, and 3 individuals of undeterminable sex, while in the fragments from the left side we counted 15 persons, 7 of them being men, 4 women, and 4 individuals of questionable sex. All the fragments originate from adult or probably adult individuals, only the left-sided fragment No. 20 (woman ?) with spina ilica might belong both to an adult and to a juvenile individual.

Other fragments. To os coxae belong another 10 fragments with incisura ischiadica, 6 fragments from the alae with facies auricularis, another 4 smaller fragments from the alae, 1 small fragment from thre acetabulum without characteristic features, mentioned above, and 2 fragments from os pubis (adult woman and adult individual of doubtful sex).

2. *Femur — Fragments with Proximal Epiphysis*

Preserved remained a total of 13 fragments with a complete or partly intact head from the right side, 15 fragments from the left side, and 6 fragments where the side could not be more closely determined.

Metric and descriptive features. These features are summarized in Table 18. It is arranged so that it yields one of the possible answer to the number of individuals and the proportion of the two sexes.

Number of individuals. If we add to the 13 fragments from the right and to the 15 fragments from the left side four and two of the fragments with undetermined laterality, we receive according to both criteria a total minimum number of 17 persons, with whom we have met analysing some other regions.

Estimation of age. On one fragment from the right side (No. 6) and two fragments from

TABLE 18

Descriptive features and caput circumference of femur fragments with proximal epiphysis

Feature	RIGHT SIDE fragment No																	
	7	9	10	12	18	26	19	13	21	23	8	11	6					
Robusticity of bone	2–3	3	3	3	3	3	2–3	2	2–3	2	2	1–2	1–2					
Caput circumference (mm) (20)	137	150	—	—	144	152	—	—	—	—	125	—	—					
Unfinished fusion	0	0	0	0	0	0	0	0	0	0	0	0	+					
Probable sex	M?	M	M?	M?	M	M	?	?	?	?	F	F	?					
Probable age	adult						adult				adult		14–16					
Feature	UNDETERMINED SIDE fragment No ↓↑																	
	30			31	32	29					34A						33	
Robusticity of the bone	3			3	3	2–3					2						2	
Caput circumference (mm) (20)	—			—	—	—					—						—	
Unfinished fusion	—			—	—	0					0						—	
Probable sex	M?			M?	M?	?					?						?	
Probable age	?			?	?	adult					adult						?	
Features	LEFT SIDE fragment No ↓																	
	17	24	25	5	20	22	28	1	2	3	4	16	27	14	15			
Robusticity of bone	3	3	3	2–3	2–3	2	2–3	1	2	1–2	1	2	1–2	2	2			
Caput circumference (mm) (20)	153?	146	—	—	—	135?	—	128	132?	—	—	129	123	—	—			
Unfinished fusion	0	0	0	0	0	0	0	0	0	0	0	0	±	+	+			
Probable sex	M	M	M?	?	?	?	?	F	F?	F	F	F	F	?	?			
Probable age	adult			adult				adult					20–25	14–16				

Explanatory notes:
Robusticity of bone: 1 — gracile, 2 — medium, 3 — robust
Unfinished fusion of caput and trochanter maior with diaphysis: 0 — not present, ± — traces of suture, + — present
Probable sex: M — male, F — female, ? — undetermined
↓↑ — possible solution

the left side (Nos. 14 and 15) it is to be seen that the head and the greater trochanter did not united with the diaphysis. Their junction occurs between the age of 16 and 18 years. Owing to the general size of the fragments, we may assume that remains of juvenile persons aged 14 to 16 years are involved. From the fragments with undetermined laterality we may admit No. 33 to the same age. The trace of a suture on the head of the fragment from the left side (No. 27), belonging to a woman, speaks for an age of 20 to 25 years. In all other cases we can only say that adult persons are concerned.

Proportion of men and women. If we put aside above mentioned remains of juvenile individuals, we can find among the remaining fragments from the right side 6 probable men, 2 women, and 4 individuals of undeterminable sex, while in the fragments from the left side 3 men, 6 women, and 4 individuals of questionable sex, and in the fragments without determination of the side 3 men and 2 individuals of undetermined sex. From Table 18 we can see that according to the left side a minimum number of 2 juvenile individuals and 6 adult women has been established; the rest, i.e. 9 persons, might have been men, distinguished in a minimum number of 9 persons also according to the fragments of the frontal and occipital bones (see above).

3. *Femur — Fragments from Diaphysis*

Preserved are a total of 17 bigger fragments from the femoral diaphysis, in 11 of which it was possible to measure the diameters of the middle of the diaphysis or the subtrochanteric diameters. To them it was necessary to add fragments No. 7 and No. 8 with proximal epiphysis, where it was also possible to measure the subtronchanteric diameters, and fragment No. 34/B with distal epiphysis, where

TABLE 19

Metric and descriptive features of femur diaphysis fragments

Feature	Fragment No													
	7	54	57	59	46	56	58	8	50	51	52	34B	47	53
Side	RIGHT				LEFT			RIGHT				LEFT		
Sagittal diameter of diaphysis middle (6) (mm)	—	28	—	34	—	28	30	—	24	24	26	27	27?	27
Transversal diameter of diaphysis middle (7) (mm)	—	—	—	28	—	26	25	—	24	26	23	25	24?	22
Upper sagittal diameter of diaphysis — subtrochanteric (10) (mm)	22	—	21	26	24	—	—	23	21	—	21	—	—	—
Upper transversal diameter of diaphysis — subtrochanteric (9) (mm)	29	—	30	33	29	—	—	31	—	—	25	—	—	—
Index of diaphysis middle section — pilastricus (6 : 7)	—	—	—	121.4	—	107.7	120.0	—	100.0	92.3	113.0	108.0	112.5?	122.7
Index of diaphysis upper section — platymericus (10 : 9)	75.9	—	70.0	78.8	82.8	—	—	74.2	—	—	84.0	—	—	—
Pilaster	—	2—3	—	3	—	3	3	—	1	0	2	1	2	2
Platymery	2—3	—	3	2—3	2	—	—	3	2	—	2	—	—	—
Fossa hypotrochanterica	0	—	+	0	0	—	—	0	0	+	0	—	—	—
Robusticity of bone	2—3	3	2—3	3	2—3	3	2—3	2	2	2	2	2	2	2
Probable sex	M?	M?	M?	M	M?	M?	M?	F	F	F	F?	F?	F?	F?

Explanatory notes:

Pilaster: 0 — not present, 1 — low, 2 — medium, 3 — high
Platymery: 0 — not present, 1 — some, 2 — medium, 3 — expressive
Fossa hypotrochanterica: 0 — not present, + — present
Robusticity of bone: 1 — gracile, 2 — medium, 3 — robust
Probable sex: M — male, F — female, ? — undetermined

diameters of the middle of the diaphysis were established.

Metric and descriptive features. These criteria have been summarized in Table 19 together with the data on the probable sex. The index of the diaphysis middle section (pilastricus) shows a relatively high variation ranging from 92.3 to 122.7, which corresponds to the absence up to a considerable development of the pilaster, as the aspective data conformably point to. On the other hand, the index of the diaphysis upper section (platymericus) has a more uniform character within the range of 70.0 to 84.0, which corresponds to hyperplatymeria up to platymeria of Martin's division (1928, p. 1045) and aspective data. Fossa hypotrochanterica was present only in 2 out of 8 cases.

4. *Femur — Fragments with Distal Epiphysis*

Preserved are a total of 12 bigger fragments, containing the whole distal epiphysis, and another 19 smaller fragments from the distal epiphysis proper.

On all 12 bigger fragments the distal epiphysis was smoothly grown together without the slightest traces of sutures.

5. *Patella*

Preserved are two slightly defective right-sided patellae, belonging for their size and robusticity to men.

Patella No. 1. Maximum height 45 mm, maximum breadth 48 mm, maximum thickness 22 mm, height-breadth index 93.8.

Patella No. 2. Maximum height 44 mm, maximum breadth 44? mm, maximum thickness 21 mm, height- breadth index 100.0.

6. *Tibia*

Preserved are a total of 8 larger and another 9 smaller fragments with proximal epiphysis, 11 fragments with distal epiphysis, 2 bigger fragments from the diaphyses, and 8 characteristic fragments of compacta of the diaphysis.

Among the 8 larger fragments with proximal epiphysis a not united epiphysis was found in one case from the left side (No. 5). Fusion occurs at the age of between 17 and 20 years, so that this find reconfirms the presence of a juvenile individual aged 14 to 17 years. On the other hand, the distal epiphysis was smoothly grown together with the diaphysis in all 11 fragments.

A small number of fragments yielded metric data, which together with the descriptive data and the estimation of the sex are presented in Table 20.

TABLE 20

Metric and descriptive features of tibia fragments

Feature	Fragment No							
	1	6	9	10	15	16	20	21
Side:	L	R	L	L	R	R	L	R
Maximum diameter of diaphysis in the level of foramen nutricium (8a)	36?	34	—	—	—	—	32	—
Transversal diameter of diaphysis in the same level (9a)	23?	21?	—	—	—	—	18?	—
Index cnemicus (9a : 8a)	63,9?	61,8?	—	—	—	—	56,2	—
Maximum breadth of the distal epiphysis (6)	—	—	47?	49	44	43	—	—
Minimum circumference of the diaphysis (10b)	—	—	—	—	—	—	—	72
Platycnemy	3	3	—	—	—	—	3	—
Robusticity of the bone	3	2–3	3	3	2	2	2	2
Probable sex	M	M?	M?	M?	F?	F?	F?	?

Explanatory notes:

Side: L — left, R — right
Platycnemy: 1 — slight, 2 — medium, 3 — expressive
Robusticity of bone: 1 — gracile, 2 — medium, 3 — robust
Probable sex: M — male, F — female, ? — undetermined

The index cnemicus shows all three values within the range of platycnemia of Khuff's division (Martin, 1928, p. 1052).

7. *Fibula*

Distinguished were only 8 smaller fragments that did not yield any information except for the smoothly grown together distal epiphysis found in three of them.

8. *Talus*

Preserved are 17 complete, defective and fragmentary tali, 12 of which are left- and 5 right-sided. The dimension of 13 of them with the estimation of the sex are given in Table 21.

Surprising is primarily the fact that the absolute dimensions have a tendency to higher values, so that it was not possible, on the basis of analogies with the material from the Wadi Qitna cemetery (see further), to distinguish any probable women. In turn, the talus of one juvenile individual is present. Out of four other tali that could not be measured two belong probably to men, one to a woman, and another to an individual of questionable sex. The proportional relations of all tali are very constant, as the variance spectrum of both indices (length-breadth 75.0 to 83.3 and length-height 40.0 to 54.7) indicates.

9. *Calcaneus*

Among the material were also found 17 defective and fragmentary calcanei, 10 of them being left- and 7 right-sided. The dimensions of 9 of them, together with the estimation of the sex are contained in Table 22.

Just as in the case of the talus, the absolute dimensions are generally greater than those found at Wadi Qitna, so that no women could be distinguished. Only of the further unmeasurable fragments, one may belong to a woman, while the others cannot be dignosticated. In the proportions, there exists a greater variation than with the talus (length-height index 39.6 to 50.6).

General Evaluation

Number of Individuals

The highest number of individuals, buried in the collective tomb No. 2, runs into 17 persons. This number has been established according to the fragments of the frontal bone (medial parts), the occipital bone, the mandible, and the femur (proximal epiphysis). The striking agreement of the results according to four criteria independent of one another makes it probable that this number of individuals, which with certainty can be regarded as *minimum*, does not much exceed the *maximum* possible number of individuals.

Proportion of Adults and Juveniles

Among the material no individual younger than 14 years has been found. The presence of one individual of juvenile age is proved by fragments from the medial and both lateral parts of the frontal. According to the tibia it was possible to estimate the age of 14—17 years, according to the femur still narrower range of 14—16 years. The presence of another juvenile individual of the same age is proved by the sacrum and left proximal epiphysis of the femur. Its remanis may also be concealed in one of the proximal epiphyses of the femur with undetermined laterality, among the fragments from the medial parts of the frontal bone, the occipital bone, the mandible and from the left iliac bone, ascribed to women, and among the fragments of

TABLE 21

Metric features of talus

Feature	Fragment No												
	1	2	3	4	5	6	12	13	7	8	9	14	16
Side	L	L	L	L	L	L	R	R	L	L	L	R	R
Length (1)	56	56	54	54	53	54	54	55	51	52	52	51	43
Breadth (2)	44	43	44	41	—	41	45	—	40?	39	40	40?	34
Height (3)	29?	30?	28	29?	29?	28?	29	—	27?	26?	26?	—	23?
Length — breadth index (2 : 1)	78.6	76.8	81.5	75.9	—	75.9	83.3	—	78.4?	75.0	76.9	78.4?	79.1
Length — height index (3 : 1)	51.8?	53.6?	51.8	53.7?	54.7?	51.8?	53.7	—	52.9?	50.0?	50.0?	—	53.5
Probable sex	M	M	M?	M?	M?	M?	M?	M	?	?	?	?	?
Probable age	adult												juvenile

TABLE 22

Metric features of calcaneus

Feature	Fragment No								
	1	2	3	4	17	10	11	6	12
Side	L	L	L	L	L	R	R	L	R
Maximum length (1)	85?	83?	84?	84?	81	91	79	—	77?
Minimum breadth (3)	30	25	—	—	—	—	—	26?	—
Height (4)	39	35	—	34?	36	36	40	—	33?
Length — breadth index (3 : 1)	35.3?	30.1?	—	—	—	—	—	—	—
Length — height index (4 : 1)	45.9	42.2	—	40.5	44.4	39.6	50.6	—	—
Probable sex	M	M	M	M	M?	M	M?	?	?
Probable age	adult								

undetermined sex from the right temperal bone. It can be assumed that among the minimum number of 17 individuals there were two juveniles aged 14—16 years, while the remaining 15 ones were full adults.

Proportion of Men and Women

The highest estimate of the number of men makes, according to the frontal bone (medial part), the iliac bone with spina ilica ant. inf., 9 persons. The highest estimate of the number of women reaches, according to the frontal bone (medial part), the occipital bone, and the mandible, 7 persons; however, it is not excluded that they comprise the second juvenile individual. The nearest lowest number of 6 women is demonstrated by the fragments of the temporal bone (right) and the proximal epiphysis of the femur (left). A striking preponderance of the number of men over that of women manifests itself also in the talus and the calcaneus. Therefore, it is possible to draw the conclusion that among the adult persons probably 9 men and 6 women were present (ratio 3 : 2).

Estimation of Age of Adults

Out of 15 adult individuals, 3 reached an age of 20 to 30 years, another individual 20 to 40 years, according to the lateral parts of the frontal bones. According to the sacrum one person died at an age

TABLE 23

Probable age of individuals from Tomb No. 2

Age group	Years	*n*	%
Juvenile	14—16	2	11.8
Young adult age	20—30	4	23.6
Middle adult age	30—50	7	41.1
Old adult age	50—60	1	5.9
Adult age	20—60	3	17.6
Total	14—60	17	100.0

TABLE 24

Comparison of mean values from Naga el-Farik and Wadi Qitna samples

Feature	Males					Females				
	Naga el-Farik		Wadi Qitna			Naga el-Farik		Wadi Qitna		
	n	$\bar{x}$	n	$\bar{x}$	s	n	$\bar{x}$	n	$\bar{x}$	s
Mandible+)										
Symphyseal height (69)	4	31.5	43	32.2	2.1	4	27.2	39	30.4	2.0
Height of body at the level of foramen mentale (69,1)	7	33.0	68	31.0	2.2	6	28.8	50	29.5	2.0
Thickness of body at the same level (69,3)	9	11.4	71	12.0	1.4	7	11.9	53	11.3	1.4
Thickness of mandibular body index at the same level (I 66)	7	34.8	68	38.8	5.2	6	42.3	50	38.5	4.5
Height of ascending ramus (70)	—	—	—	—	—	2	57.5	38	51.8	3.4
Minimum breadth of ascending ramus (71)	4	33.0	63	34.2	2.8	3	32.3	47	32.4	2.1
Ascending ramus index (I 63)	—	—	—	—	—	2	54.8	37	62.7	4.8

Feature	NF Both sides		WQ Right side			WQ Left side			NF Both sides		WQ Right side			WQ Left side		
	n	$\bar{x}$	n	$\bar{x}$	s	n	$\bar{x}$	s	n	$\bar{x}$	n	$\bar{x}$	s	n	$\bar{x}$	s
Humerus																
Minimum circumference of diaphysis (7)	10	63.0	50	61.0	3.3	45	59.0	3.2	5	53.2	29	53.0	3.6	43	52.2	4.1
Circumference of caput (8)	3	145.3	30	137.2	5.8	27	136.4	7.5	—	—	—	—	—	—	—	—
Radius																
Minimum circumference (3)	—	—	—	—	—	—	—	—	2	34.5	44	34.9	2.8	37	35.8	2.8
Femur																
Sagittal diameter of diaphysis middle (6)	4	30.0	30	29.7	3.0	29	29.9	2.5	6	25.8	22	24.5	3.0	28	24.7	3.1
Transversal diameter of diapiphysis middle (7)	3	26.3	29	25.9	1.9	29	26.0	1.1	6	24.0	22	22.8	1.8	28	22.9	1.3
Index of diaphysis middle section-pilastricus (6 : 7)	3	116.4	29	115.0	12.5	28	115.4	10.7	6	108.1	22	107.3	11.7	28	107.8	12.9
Upper sagittal diameter of diaphysis-subtrochanteric (10)	4	23.2	30	24.6	2.1	26	24.4	1.9	3	21.7	26	21.0	2.0	26	21.1	1.7
Upper transversal diameter of diaphysis-subtrochanteric (9)	4	30.2	32	29.1	2.1	27	29.3	1.8	2	28.0	26	26.8	2.0	28	27.0	1.9
Index of diaphysis upper section-platymericus (10 : 9)	4	76.9	30	85.6	10.8	26	83.6	8.5	2	79.1	26	78.4	7.4	26	79.0	7.5
Caput circumference (20)	7	145.3	46	140.7	6.3	38	142.6	7.2	5	127.4	29	127.1	2.5	29	125.6	6.1

Feature	Males								Females							
	NF Both sides		WQ Right side			WQ Left side			NF Both side		WQ Right side			WQ Left side		
	n	$\bar{x}$	n	$\bar{x}$	s	n	$\bar{x}$	s	n	$\bar{x}$	n	$\bar{x}$	s	n	$\bar{x}$	s
Tibia																
Maximum diameter of diaphysis in the level of foramen nutricium (8a)	2	35.0	37	34.6	2.7	37	35.0	2.4	—	—	—	—	—	—	—	—
Transversal diameter of diaphysis in the same level (9a)	2	22.0	34	22.4	2.6	33	22.8	1.9	—	—	—	—	—	—	—	—
Index cnemicus (9a : 8a)	2	62.8	34	67.7	7.2	33	64.6	6.3	—	—	—	—	—	—	—	—
Talus																
Length (1)	8	54.5	89	53.7	2.9	87	53.3	2.7	—	—	—	—	—	—	—	—
Breadth (2)	6	43.0	78	42.7	2.8	81	42.3	2.7	—	—	—	—	—	—	—	—
Height (3)	7	28.9	79	28.7	2.0	65	28.5	1.9	—	—	—	—	—	—	—	—
Length-breadth index (2 : 1)	6	78.7	77	79.8	5.6	80	79.2	4.4	—	—	—	—	—	—	—	—
Length-height index (3 : 1)	7	53.0	78	53.4	2.9	65	53.6	2.7	—	—	—	—	—	—	—	—
Calcaneus																
Maximum length (1)	7	83.9	90	82.0	3.9	80	82.0	3.9	—	—	—	—	—	—	—	—
Minimum breadth (3)	2	27.5	83	26.5	2.4	76	26.2	1.9	—	—	—	—	—	—	—	—
Height (4)	6	36.7	91	36.6	2.7	83	36.8	2.7	—	—	—	—	—	—	—	—
Length-breadth index (3 : 1)	2	32.7	75	32.4	2.9	72	31.9	2.4	—	—	—	—	—	—	—	—
Length-height index (4 : 1)	6	43.9	84	45.0	3.4	76	44.9	3.4	—	—	—	—	—	—	—	—

Explanatory notes:
All dimensions in millimetres
-) Mandibular bilateral measurements were taken, as a rule, on the left side
n — number of specimens
$\bar{x}$ — arithmetic mean
s — standard deviation
NF — Naga el-Farik
WQ — Wadi Qitna

under 22 years, another one under 25 years. According to the fragments of the femur with proximal epiphysis, one 20 to 25-year-old individual was present. According to the left iliac bone, two persons aged 25 to 30 years were distinguished (according to the right only one). It can thus be said that probably 4 persons died at younger adult age (20 to 30 years).

At the age of 30 to 40 years died a woman represented by calvaria No. 1, at the age of 40 to 50 years a woman from whom calva No. 31 was preserved. An age over 30 years is proved in 5 individuals by remains of the mandible, while in one individual by fragment of the sacrum. According to the occipital bone, 10 individuals died before reaching the age of 50, another 2 individuals before reaching the age of 60 years. If we deduct from their sum (12) persons of a younger adult age (4) and an individual of older age (1), we receive a total of minimum 7 individuals who reached middle adult age (30 to 50 years).

In a single case it is possible according to the lateral parts of the frontal bone to infer to older adult age (30 to 50 years).

The remaining 3 adult individuals may theoretically belong to whatever of the listed age classes.

The division of individuals into age classes is shown in Table 23. It can be said that the majority of persons died at middle and younger adult age.

Morphological Type

For the accurate determination of the anthropological type the necessary criteria, especially for the facial skeleton, are missing. The morphology of the frontal bone would in a certain number of cases admit, according to the tendency towards merging of the frontal protuberances or according to the regularly vaulted profile in men, the possibility of a certain negroid infiltration, yet in itself it is not a sufficient evidence for it. A characteristic feature

of the buried group of persons it the poor development of the glabella, the supraorbital arches, and the external occipital protuberance. The bones are generally medium robust and have an adequate muscular relief.

The metric data can be compared with average values and variation of the series X group (4th to 5th centuries A.D.) from the cemetery at Wadi Qitna, lying 13 miles to the north of Naga el-Farik and investigated during excavation made by the Czechoslovak Institute of Egyptology Charles University, in 1965 (Strouhal, 1966, 1968, 1971). Calvaria No. 1 from Naga el-Farik exhibits a different type by its essentially shorter length (by more than -s) and bigger breadth dimensions, especially the biauricular breadth (by $+2\,\sigma$). The frontal bone No. 2 differs by its very low minimum breadth of the forehead (by $-4^1/_2\,\sigma$) and the breadth of the upper face (by $-2\,\sigma$).

The average values of the other dimension from Naga el-Farik are compared with the data from Wadi Qitna in Table 24. Most measurements from Naga el-Farik approximate the values from Wadi Qitna and to not exceed the limit $x \pm \sigma$ of this series. Different are, however. the height of the mandibular ascending ramus, the mandibular ramus index, and the humeral head circumference, which are markedly greater at Naga el-Farik (by $+1\,\sigma$ to $+2\,\sigma$).

Owing to the small number of cases it is not possible to draw an unambiguous conclusion. It can only be assumed that the group of persons from Naga el-Farik was not indentical in its features with the population of X group. The differences in the structure of the skull and the mandibular ramus lead to the conclusion that in contrast to the Negroid tendency displayed by the set from Wadi Qitna, a basically Europoid tendency was present at Naga el-Farik. Some found pecularities (low minimum breadth of the forehead) recall similar findings in recent Upper Egyptian population groups (Strouhal—Reisenauer, 1963, 1964).

Other indications (agreement between the dimensions of calvaria No. 1 and calva No. 31, the low variation of the dimensions of the talus) admit the possibility that the studied groups was endogamous.

Finds of Animal Bones

In tomb No. 2 a number of animal bone fragments, whose determination was carried out by the courtesy of Dr. O. Fejfar, of the Central Institute of Geology in Prague, were also found seattered. In the material are represented the following genera (families):

Camelus sp.	— calcaneus dx, femur (trochanter maior), radius (distal fragment)
Bos sp.	— metapodium (distal fragment), astragalus (both)
Caprinae	— talus sin., humerus dx (distal fragment)
Suidae sp.	— metapodium (fragment).

The fragments were found both in the antechamber and in the burial chamber in the same layer as the fragments of human bones. Involved are currently endemic mammals (cattle, goats or sheep, pigs), whose domestication can be assumed. They probably were put in the tomb as sacrificial gifts of meat.

In connection with the dating of the tombs into the period of the New Kingdom the presence of camel remains is of importance.

There is scarce evidence of the occurence of a camel in the late predynastic to the early dynastic period (Abusir-el-Melek, Heluan). The breeding of camels was introduced into Egypt in the Persian period (last quarter of the 6th to the 5th century B. C., Helek-Otto, 1956) and spread especially in the Ptolemaic period (Žába, 1966).

ROCK TOMB NO. 3

In this tomb no archaeological or anthropological material was found. It evidently had already been fully emptied in the past.

SUMMARY

Anthropological material from two out of three rock tombs from the period of the New Kingdom found at Naga el-Farik in Egyptian Nubia, explored by the expedition of the Czechoslovak Institute of Egyptology Charles University in Prague, in 1964, was analysed. The human remains were in a fairly fragmentary state and it can be assumed that they were intentionally destroyed by grave plunderers. In tomb No. 1 a man aged 40 to 50 years and a child of 3 to 5 years were buried. In the collective tomb No. 2 a minimum number of 17 individuals, 2 of whom had died at the juvenile age of 14 to 16 years, while the others at an adult age, was discerned. This was established by the anatomical method of analysis of tiny fragments with mutual confrontation of the results from various parts of the skeleton. Among the adults there were probably 9 men and 6 women. Most of them had reached the middle age of 30 to 50 years, followed by others with younger age of 20 to 30 years, while the older age of 50 to 60 years was rather an exception. The morphological type could be recognized only in some indications, e.g. in the poor development of secondary sexual characters on the skull, the general moderate robusticity, and the adequate muscular relief. From the strongly Negroid character of the X. group series from Wadi Qitna they differ by certain features pointing rather towards the Europoid tendency of the Upper Egyptian population type. From tomb No. 2 also came bones of cattle, goats or sheep and pigs, together with remains of a camel. Tomb No. 3 did not yield any finds.

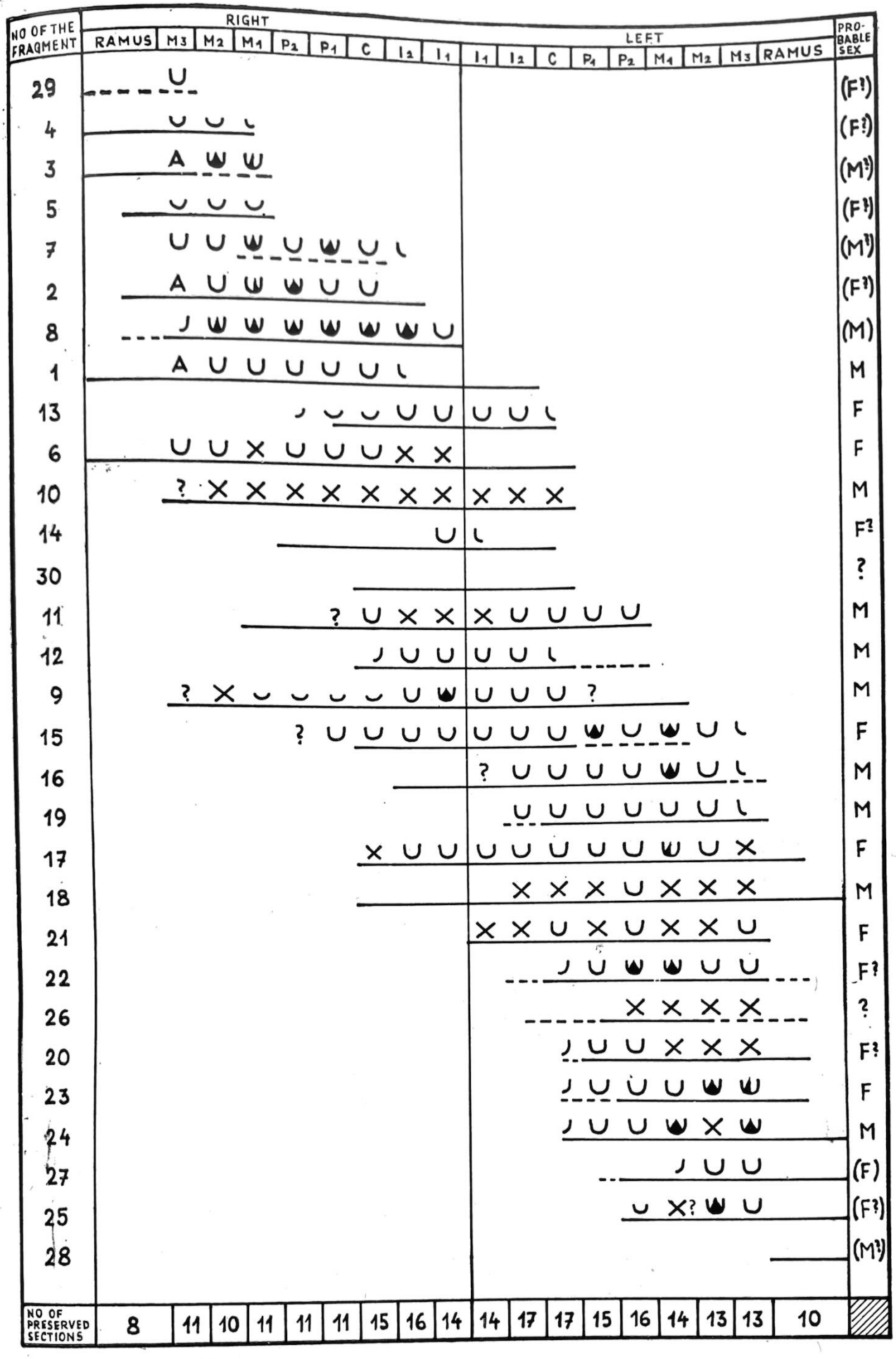


FIG. 1

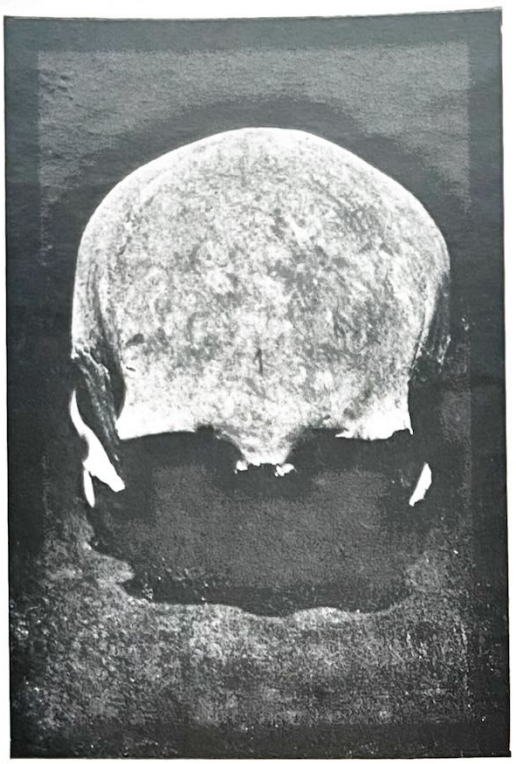
Schematic presentation of preservation of mandibular fragments

Explanatory notes:

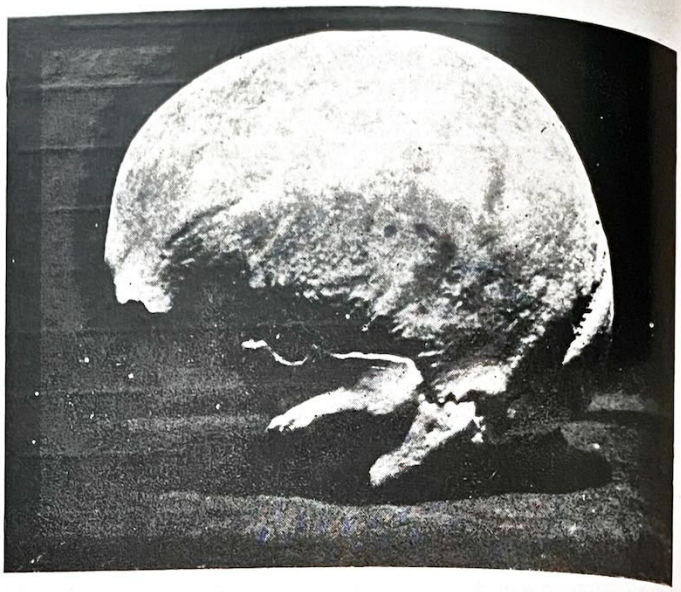
——— lower margin (base) of mandible
– – – lower margin broken off, higher part of bone preserved
U empty whole alveolus
∪ base of empty alveolus
alveolus with corresponding tooth
X intravitally lost tooth
A tooth congenitally missing (hypodont)
F females
M males

FIG. 2

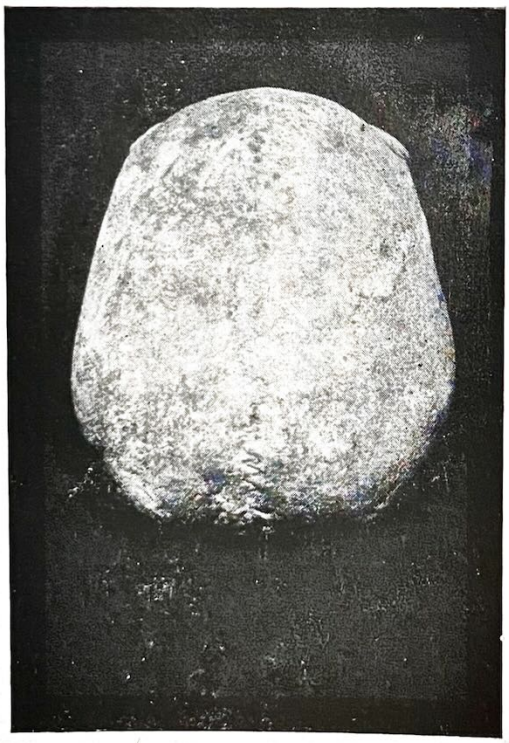
Calvaria No. 1, female, 30—40 years (photo by Strouhal)



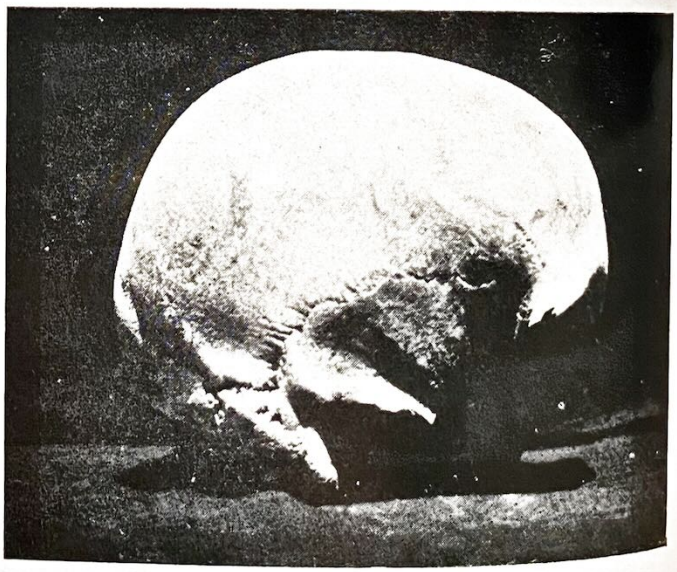
A) Norma frontalis



C) Norma lateralis dextra



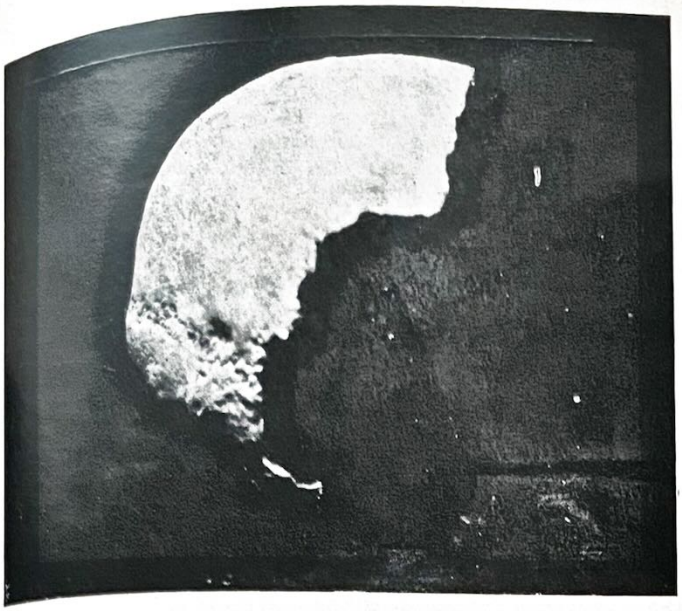
B) Normal verticalis



D) Norma lateralis sinistra

FIG. 3

Incomplete calva No. 31, female, 40—50 years (photo by Strouhal)

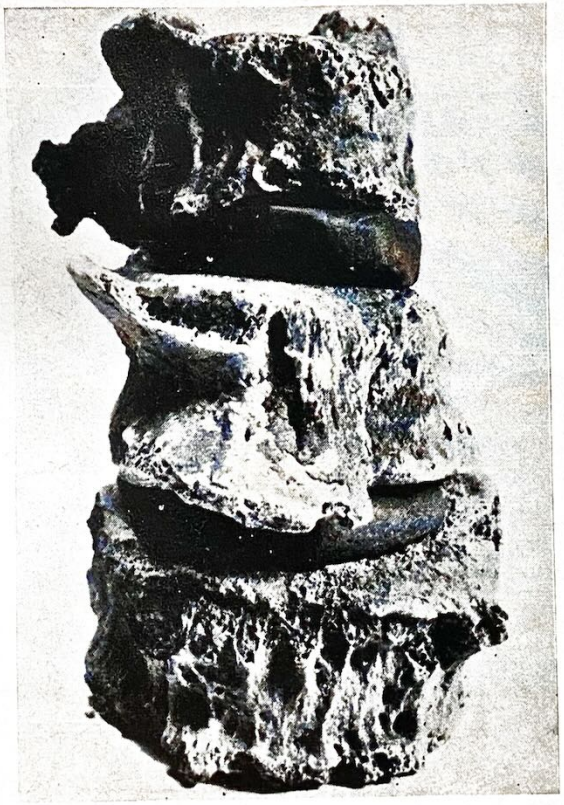


A) Norma lateralis dextra

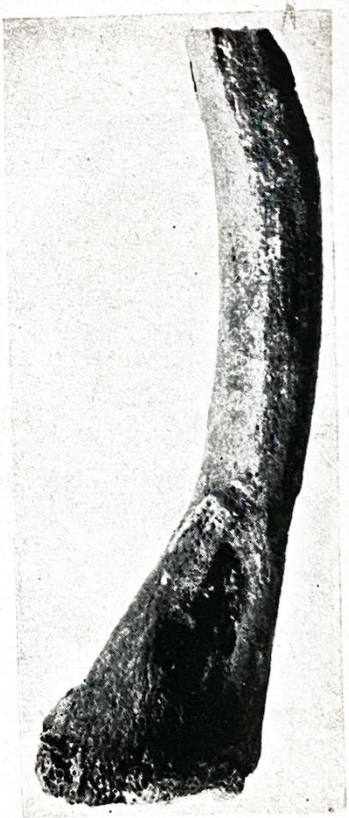
B) Norma occipitalis

FIG. 5

A) Two thoracic vertebrae joined into a block



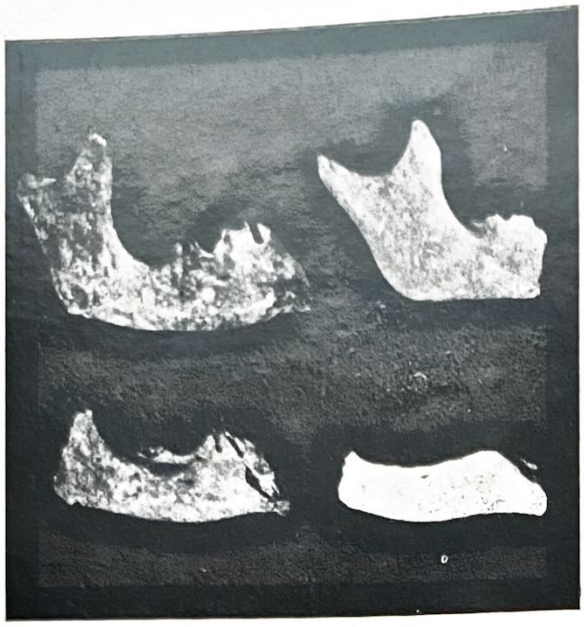
B) Three lumbar vertebrae with marked osteophytic processes



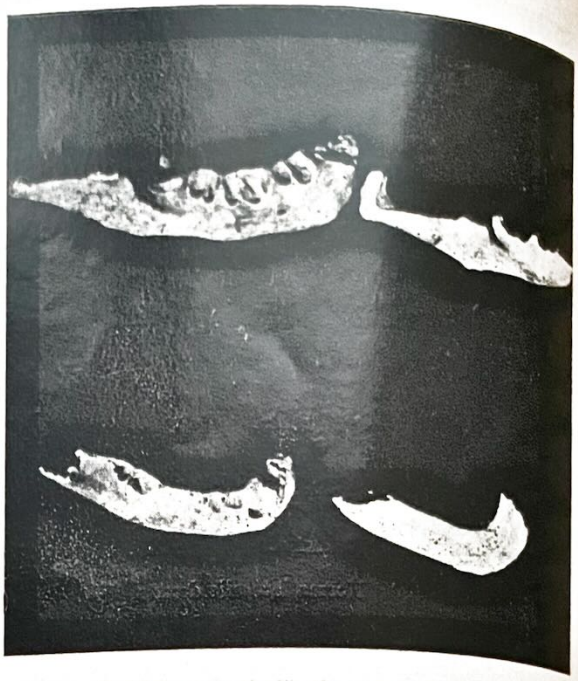
C) Lower face of medial half of right clavicula No. 9 with large fossa costoclavicularis with traces of inflammatory process (all photos by Zemina)

FIG. 4

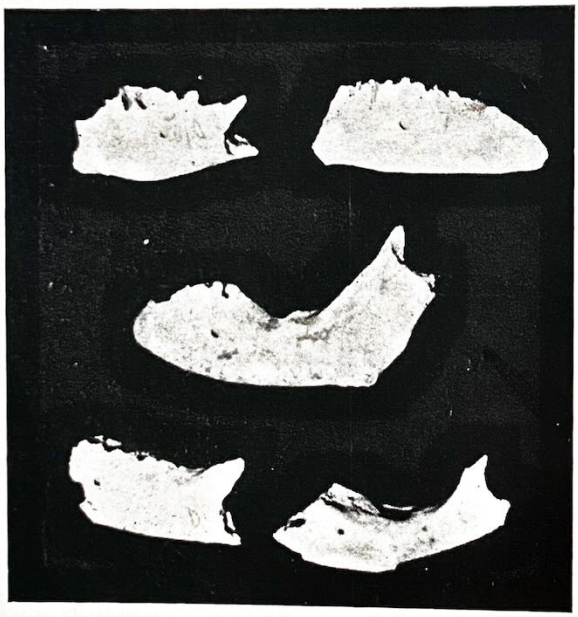
Specimens of mandible (photo by Strouhal)



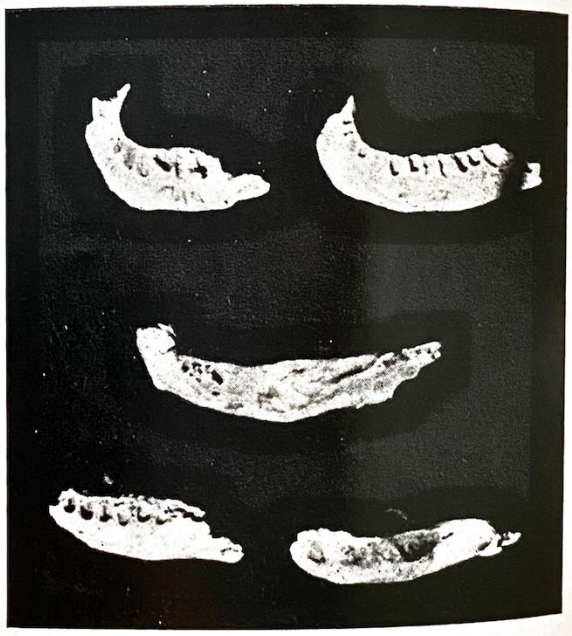
A) Norma lateralis dextra, up Nos. 1, 4, down Nos. 6, 10



B) Norma verticalis, the same succession



C) Norma lateralis sinistra, up Nos. 16, 17, middle No. 18, down Nos. 20, 26



D) Norma verticalis, the same succession

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Dr. Eugen Strouhal

Náprstek Museum,
Betlémské 1, 110 00 Praha 1.