II

ANTHROPOLOGICAL INVESTIGATIONS OF LATE HEATHEN GRAVES IN UPERNAVIK DISTRICT

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With 11 figures and 28 tables

Introduction

The Eskimos came to Greenland in several waves, each group carrying with it its own culture. Skeletal materials are however only available from the Inugsuk Culture, the latest culture period.

As already mentioned, the investigations of the skeletal materials described above primarily concern the Inugsuk people as they were like shortly after immigrating to Greenland. Their contact with white men essentially takes place during the last two centuries, and coincides with the introduction of Christianity. Thus, by analyzing the skeletal remains of the last heathen Greenlanders, one arrives at a picture of the development of the Inugsuk people throughout half a millenium in Greenland, and at the same time has a basis of comparison between the last pure Eskimos and the present-day Greenlanders.

Several investigations of the physical anthropology of these immigrated peoples have already been published (JØRGENSEN, 1954; LAUGHLIN & JØRGENSEN, 1956; SKELLER, 1954; GESSAIN, 1960).

Technique

The skeletal materials were investigated in the traditional way, *i.e.* first by attempting to isolate the individual skeletons in order to find out how many persons were interred in each grave, next by endeavouring to identify their sex and age.

All measurements were made in accordance with the definitions given in *Lehrbuch der Anthropologie* (MARTIN, 1957). The figures thereby obtained were statistically analyzed. All of the measurements are contained in the collective tables at the close of this paper, whereas only the inferred means, distribution, etc., appear in the tables in the text.

The statures were inferred in accordance with the formulae worked out by TROTTER & GLESER (1958) on the basis of the length of the *femur*, if this bone was preserved, the *tibia*, if the *femur* was missing, and the *humerus*, if the lower extremity bones were lacking.

In addition to the anthropological analyses, the bones were examined for a number of non-metrical, so-called discontinuous traits, which presumably have a hereditary significance.

Finally, pathological changes were noted, even though it was impossible to go into detail in this area. Moreover, because of the very differing state of preservation of the bones, statistical conclusions regarding the frequency of certain diseases in the Upernavik District could not be made on the basis of this material.

The Skeletal Material

The skeletal material, which derives from 5 localities, comprises the remains of a total of at least 103 individuals (table 1). The number of persons in each grave varies from 1 to at least 14 (Angmaussaq grave 29).

The state of preservation in some of the graves was, however, so poor that it is likely that these graves contained more individuals than it was possible to determine; thus, the conclusions which one would like to make about the size and structure of the population on the basis of this material is unreliable. Yet, it should be possible to arrive at some kind of inference.

As indicated in table 1, 14 of the buried persons are children, 11 of them less than 6 years of age.

Table 1. *The Material:*

	Infants I	Infants II	Males	Females	Adults of undefinable sex	Total
Angmaussaq	8	2	23	29	13	75
Sãtoq	2		4	6	2	14
Nordø	1		2	2	1	6
Upernaviarssuk		1	1	2	2	6
Tapeq			1	1		2
Total	11	3	31	40	18	103

The very small number of children is surprising; no doubt the most obvious explanation is either, as mentioned above, that the state of preservation was so poor that many skeletons, especially children's skeletons, had completely disappeared, or else that infants were not buried in the same place as other individuals. Needless to say, the third possibility, *i.e.* that infant mortality could really have been so low, must not be ignored, even though it does seem to be particularly unlikely.

Figure 1 furthermore shows, albeit with lesser reliability, that an individual who survived the first years of life had a good chance of reach-

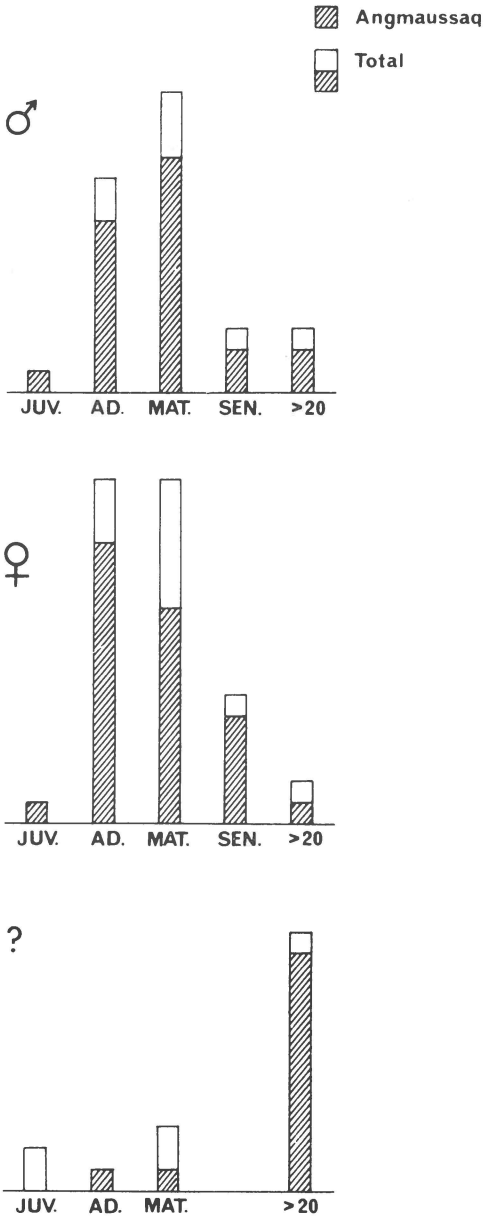


Fig. 1. The Material.

ing maturity. Only a few persons died as youths. The figure in which the adults are divided into the traditional age groups, moreover gives a graphic illustration of the manner in which this division took place.

Furthermore the figure shows that there are more women than men in all of the age groups; it will also be noted that the majority of the

adults of undetermined sex doubtless are women, which the more detailed results of the measurement results indicate (V, p. 18).

It is not remarkable that there are more women than men in the graves; this does not necessarily mean that there was the same ratio between men and women in the live population. In a hunting society some of the men can be expected to die far away from home while hunting or traveling, and to be buried in one way or another there, whereas the women will primarily die close to home and be buried in the settlement's graveyard.

It is worth noting that the ratio between the number of deceased men and women is more or less the same in all the adult groups; this could mean that men in all age groups can risk losing their lives away from home, and that the risk apparently is the same for young men and older men.

Perhaps the older men's greater experience makes up for their declining physical strength.

Fig. 1 also shows that the largest number of the deceased belongs in the maturus group (40–60 years) as far as men are concerned, whereas just as many women died young (20–40 years) as in the mature age (40–60 years). There are even more women in the adulta than in the matura group in the Angmaussaq graves. These ratios should, however, be judged most cautiously, for, as can be seen, in the Angmaussaq graves in particular there is a considerable number of adults of undeterminable sex and age. It is not unlikely that the number of adult men and mature women predominate in this undetermined group; the younger male crania can show typical male features to a lesser degree than the older ones, but on the other hand the older female crania can tend to have a heavier and coarser structure than the younger ones. Thus, it is precisely in these groups that it is often difficult to determine the sex of the individuals, and that this may even have to be abandoned.

Accordingly, in conclusion of this very cautions analysis of the populations' structure it can be stated that more female than male skeletons were found in all age groups, which can be explained on the basis of social factors, namely, the men's greater risk of dying away from home.

Furthermore, most individuals who survive the first years of life evidently die at the mature age of 40–60 years.

Finally, child mortality, especially infant mortality, can scarcely be judged on the basis of the available material.

Measurements on the Skull

All individual measurements are collected in tables at the close of this paper; these tables also show the inferred means and the standard deviations. Only the most significant measurements can be compared with other materials, and in the majority of cases comparisons must be limited to the mean dimensions.

The comparative material comprises:

1. Two previously published materials from Greenland, namely, a collection of crania from the Inugsuk Culture period and one from the Northeast Greenland cultural area (JØRGENSEN, 1964).

2. A collection of skeletons from Labrador dated at a period corresponding to the Inugsuk Culture. Earlier investigations have clearly shown that these skeletons do not differ from the Inugsuk skeletons and that these 2 groups make up one population, both anthropologically and genetically (STEWART, 1939; JØRGENSEN, 1964).

3. For the purpose of casting more light on the Eskimos' mutual relationship, the comparative material has been further expanded to comprise earlier Eskimos (BIRNIK) from "old Igloos" at Point Barrow and late Eskimos from Point Hope (HRDLICKA, 1943).

Before proceeding to investigate the differences and the similarities between the means of these groups we will briefly examine the distribution of the individual measurement and the standard deviations.

The distribution of the most important measurements is shown in fig. 2.

If we assume that the material is normally distributed, which in any case the distribution curves do not invalidate, the standard deviations can also be compared.

The standard deviations noted in the recently analyzed materials, as well as in those in the two materials which were previously investigated, are shown in table 2.

As far as the occipital breadth is concerned, the differences are so considerable that very great reservations must be made with respect to a comparison of these measurements. In regard to all other measurements there is a particularly good agreement between the two West Greenland

Table 2. *Standard deviations.*

	♂			♀		
	U	I	NE	U	I	NE
M 5	4,3	4,1	3,3	4,7	3,6	3,9
M 8	4,9	5,1	4,5	4,9	4,1	5,0
M 9	5,2	4,3	3,4	5,3	3,8	3,6
M 11	7,3	5,0	1,1	6,7	3,9	3,3
M 17	4,6	5,2	4,0	5,6	4,6	3,6
M 23	13,2	13,5	10,8	15,1	11,9	7,9
M 38	72	117	125	121	110	66
M 40	5,0	4,9	5,3	4,9	4,7	5,3
M 45	6,2	6,0	6,1	5,2	5,0	4,2
M 48	3,9	4,0	3,0	4,5	4,0	4,0
M 49	1,9	1,9	2,1	2,5	1,5	2,0
M 51	2,2	2,0	1,6	2,1	2,0	1,8
M 52	2,1	1,9	1,5	2,0	2,0	2,1
M 66	5,2	7,0	7,3	5,8	5,7	4,3
M 8/M 1	3,1	3,9	2,4	2,6	2,7	3,4
M 17/1	2,6	2,5	2,7	2,9	2,5	2,0
M 17/8	5,6	4,9	3,5	4,4	4,2	4,3
M 47/45	4,7	4,8	5,3	(5,5)	4,6	5,3
M 48/45	2,6	3,1	4,2	2,6	3,0	4,7
M 52/51	6,3	4,9	4,0	4,5	4,6	4,6
M 54/55	2,9	4,4	4,9	4,3	3,3	3,5

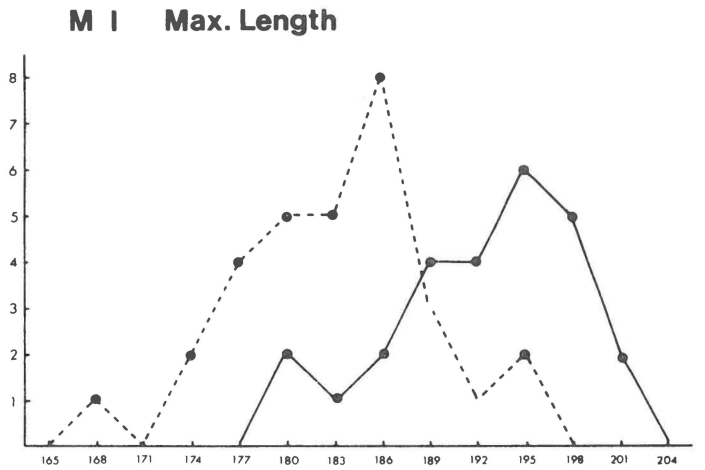
U: Upernavik, I: Inugsuk, NE: Northeast Greenland.

series, whereas the standard deviation is lower in the material from Northeast Greenland. This is impossible to explain; perhaps it is related to the small size and the extreme isolation of the population of Northeast Greenland.

The Means: As mentioned above, the broadest basis of comparison can be found in the mean dimensions. The most important of these are collected in table 3, 4, and 5. Table 3 shows the measurements of the *calvarium.*

Maximum length: As far as both men and women are concerned, the Upernavik crania are significantly longer than both the two Greenland series and the Labrador series. They are even longer than the Point Barrow crania. To date, the latter have otherwise been the longest crania, on the whole. On the contrary, the Point Hope crania are much shorter than all the others.

Basis length: This shows the same condition with respect to males as well as to females, *i.e.* that along with the "old Igloos" the Upernavik crania are the longest.



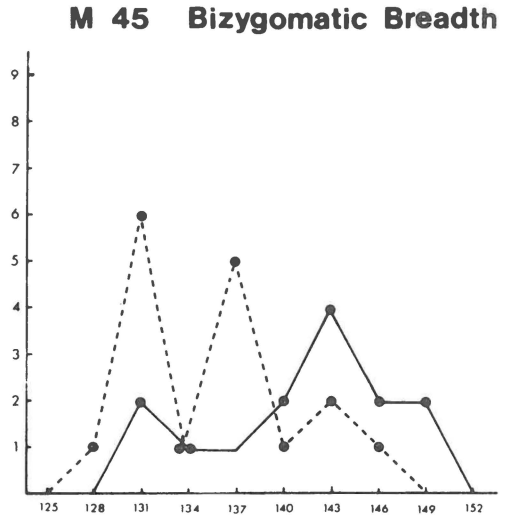
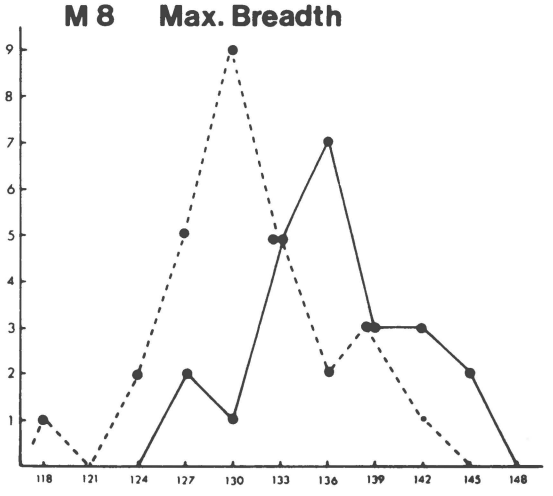
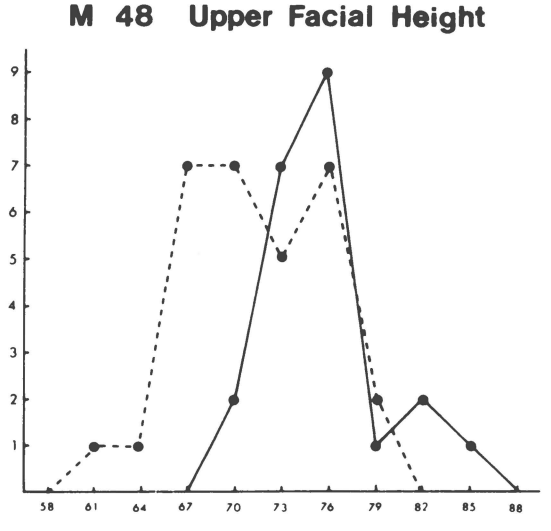


Fig. 2. Distribution of





Cranial Measurements.

Table 3. *Measurements on the Calvarium.*

	M 1 Max. Length		M 8 Max. Breadth		M 17 Basion-Bregma Height		M 5 Basis Length		M 38 Capacity		M 8/M 1 Breadth-Length Index		M 17/M 8 Height-Breadth Index	
	n	M	n	M	n	M	n	M	n	M	n	M	n	M
♂														
Upernavik District	26	192,4	23	136,3	21	138,2	23	106,3	13	1538	23	70,7	19	102,0
Inugsuk area	97	187,8	98	133,6	92	138,7	92	106,0	69	1493	97	71,2	91	103,8
North East Greenland	23	189,8	23	136,9	20	137,7	20	104,2	12	1578	23	72,2	21	100,8
Labrador	38	187,7	34	134,6	31	136,0	30	103,0		—	34	71,8	27	101,1
Old Igloo	52	191,1	52	134,2	51	142,1	51	106,8		—	52	70,3	51	105,8
Point Hope (late)	131	184,0	131	138,6	128	139,0	128	104,9	126	1474	131	75,3	128	100,3
♀														
Upernavik District	31	183,0	28	131,1	28	133,6	29	102,0	10	1443	27	71,6	18	101,1
Inugsuk area	81	179,5	82	129,8	76	133,0	78	99,9	56	1359	78	73,4	75	102,4
North East Greenland	29	179,1	29	132,4	29	130,4	29	97,4	18	1353	29	74,0	29	98,4
Labrador	37	179,6	32	129,1	24	129,0	35	98,1		—	31	72,2	29	100,1
Old Igloo	44	180,2	44	127,3	43	132,8	43	101,5		—	44	70,6		—
Point Hope (late)	92	175,7	92	134,3	89	132,0	89	98,9	84	1316	92	76,4		—

Table 4. *Measurements on the Facial Skeleton.*

	M 9 Min. Frontal Breadth		M 40 Facial Length		M 47 Facial Height		M 48 Upper Facial Height		M 45 Bizygomat. Breadth		M 66 Bigonial Breadth		M 47/M 45 Facial Index		M 48/M 45 Upper Facial Index	
	n	M	n	M	n	M	n	M	n	M	n	M	n	M	n	M
♂																
Upernavik District	25	96,7	19	104,4	18	123,7	22	75,7	14	141,4	12	110,5	11	86,5	13	53,4
Inugsuk area	97	96,0	81	103,0	59	122,5	85	74,3	83	137,3	55	112,2	56	89,4	79	54,0
North East Greenland	23	96,9	18	101,3	14	123,7	18	73,7	20	141,0	18	113,2	13	87,3	17	53,0
Labrador	–	–	23	101,6	12	123,2	32	73,3	28	136,5	–	–	10	89,6	27	54,7
Old Igloo	–	–	40	104,9	21	126,0	44	77,8	48	141,8	–	–	21	88,5	43	54,9
Point Hope (late)	–	–	105	103,1	4	124,0	118	75,2	124	143,1	–	–	4	86,7	114	52,5
♀																
Upernavik District	30	94,7	28	101,3	22	116,9	30	71,3	17	135,3	13	106,8	12	(87,3)	17	53,6
Inugsuk area	80	93,2	71	97,9	45	114,2	73	69,0	68	129,6	48	102,8	40	88,8	65	53,2
North East Greenland	29	93,1	22	94,5	16	112,9	24	68,1	28	129,7	16	101,4	16	87,1	22	53,7
Labrador	–	–	31	96,8	11	116,1	38	69,1	27	128,3	–	–	8	89,4	26	53,9
Old Igloo	–	–	31	101	19	113,4	35	71,3	41	131,4	–	–	19	87,5	34	54,7
Point Hope (late)	–	–	76	97,2	2	125	78	70,6	84	133,2	–	–	2	88,3	77	53,1

Table 5. *Measurements on the Nose and Orbits.*

	M 52 Orbital Height		M 51 Orbital Breadth		M 52/M 51 Orbital Index		M 54 Nasal Breadth		M 55 Nasal Height		M 54/M 55 Nasal Index	
	n	M	n	M	n	M	n	M	n	M	n	M
♂												
Upernavik District	24	37,3	24	45,0	24	83,0	24	23,8	24	54,5	24	43,6
Inugsuk area	90	35,9	90	43,2	90	83,4	88	22,9	87	53,7	86	42,9
North East Greenland	21	37,5	21	44,0	21	85,2	21	22,7	21	54,4	21	41,9
Labrador	29	36,0	27*)	40,2	27*)	89,5	31	22,6	31	52,4	31	43,9
Old Igloo	47	35,9	47*)	39,7	47*)	90,6	52	23,7	52	54,6	52	43,4
Point Hope (late)	115	33,6	116*)	40,2	116*)	90,5	126	23,9	126	53,6	126	44,6
♀												
Upernavic District	30	36,0	31	43,5	30	83,1	32	22,2	33	51,6	30	43,2
Inugsuk area	77	34,9	77	41,7	77	83,5	75	22,3	75	49,8	74	45,1
North East Greenland	28	35,5	29	41,3	29	95,9	27	21,6	28	50,0	27	43,2
Labrador	32	35,0	31*)	38,2	31*)	91,6	32	21,9	34	49,0	32	44,9
Old Igloo	33	35,7	33*)	38,7	33*)	92,4	39	22,9	39	50,8	39	45,2
Point Hope (late)	76	35,4	76*)	38,9	76*)	91,2	86	22,8	86	50,4	86	45,3

*) Dacryon.

Maximum breadth: The Upernavik crania are broader than the other West Greenland crania. The Point Barrow crania are narrower, and the Point Hope crania are the broadest of all.

Breadth-length index: As the Upernavik crania are large both with respect to length and breadth, only minor differences between them and the others are included in the index. It will be observed that the index of the Upernavik crania is very low, almost just as low as that of the most dolichocephalic Eskimos, namely, the Eskimos from eth "old Igloos". Notably, all the series, with the exception of the Point Hope series, are dolichocephalic.

Height: The height of the calvarium is evaluated with the aid of the basion-bregma-height. Again, the dimensions of the Upernavik crania are among the highest, even though in this case the variations are lesser. There is a curious difference between males and females in these dimensions.

Breadth-height index: This index places the Upernavik series between the relatively high Inugsuk crania and the lower Northeast Greenland crania.

Capacity: The measurements of length, breadth, and height indicate that the Upernavik crania are the largest ones from Greenland, and the small number of measured capacities confirms this observation.

All in all, the Upernavik crania are larger than the Inugsuk crania, especially as far as length is concerned. Yet the proportions of these two West Greenland series resemble one another to a considerable extent, and both differ from those from Northeast Greenland, which are broader and lower.

Facial measurements appear in table 4.

Minimal frontal breadth: This is the same in the three Greenland groups.

Facial length: The facial length is greatest in the Upernavik and "old Igloo" groups.

Facial height and Upper facial height: Again these heights indicate that the Upernavik crania are among the largest ones.

Bizygomatic breadth: In this measurement—as otherwise—the Upernavik crania are broader than the West Greenland Inugsuk crania. The difference between the Upernavik crania and the Northeast crania is significantly smaller than in other instances; this precisely corresponds to the fact that the Northeast Greenland crania differ from the Inugsuk crania in that they have broader zygomatic arches. (JØRGENSEN, 1964).

Bigonial breadth: With respect to this measurement, it is quite remarkable that whereas the mean dimension for males from the Upernavik District is the lowest, the mean dimension for women is the highest.

Orbital and nasal dimensions: These indicate particularly good conformity among the mean dimensions for all three Greenland series.

Indices: In common with the *calvarium*, the differences in ratio are far lesser than the differences in size.

Conclusion

Accordingly, the analysis of the cranial measurements shows that generally speaking the skeletal materials which now have been investigated conform to the Eskimo materials analyzed to date. The recently investigated late Upernavik crania have the same proportions as the somewhat earlier Inugsuk crania, and along with these, differ slightly from the Northeast Greenland crania, which are a little broader and lower.

The slight difference between the late Upernavik crania and the early Inugsuk crania is exclusively a question of size, for the former are larger than the latter in all dimensions.

This is obviously an essential Greenland Eskimo trait, for it has been demonstrated previously in the late, and partially poorly dated crania published in *Crania Groenlandica*, which also indicated larger measurements in all dimensions than those of the pure, earlier Inugsuk crania, but revealed the same proportions (Jørgensen, 1964).

Measurements of the long bones

Only the long bones were measured; the individual measurements are listed in the collective tables at the close of this paper. The number of measured bones is slight, and as far as the majority is concerned, only a minority of measurements has even been determined.

It was difficult to infer the sex of the bones, especially when the bones were isolated, which was frequently the case. Hence, relatively many of them are in the group whose sex was undeterminable.

The upper extremity: Fig. 3 shows the distribution of the most important measurements of the humerus. Because so little material was available, it is impossible to reach any conclusions on the basis of this figure. But as might be expected, the female bones—since this affects the determination of sex—were frailer than the male bones. And apparently the bones undetermined as to sex probably belong in the female group.

Despite the very small number of measured ulnae and radii (table 7), the conformity with the figures applying to the rest of the Greenland material is striking.

The measurements of the humerus given in table 6 show that the Upernavik bones are somewhat sturdier and, in any event, longer than the Inugsuk bones.

The lower extremity: Fig. 4 shows the distribution of the measurements of the *femora*. The male bones are longer, and both absolutely and relatively thicker than the female bones. The undetermined bones most closely resemble the male bones with respect to length, and the female bones with respect to robustness; this could very well explain why it is so difficult to determine their sex.

Concerning the *index pilastricus*—as an expression of the upward flatness of the thigh bone—the Collective Tables show that there is such a large deviation (s: 8,2–13,1) and variation (from ca. 75.0 to 120.0) that the importance of this index, in any case in the available material, is extremely problematical. Remarkably enough, here the Upernavik skeletons clearly differ from the bones from the Inugsuk region and

Table 6. *Measurements on the Humerus.*

			♂			♀			
			R		L		R		L
	Upernavik.....	13	307.2	7	306.7	8	293.9	7	281.0
M 1	Inugsuk.....		30	302.9			20	280.5	
	NE. Greenland..		10	310.7			12	280.5	
	Upernavik.....	13	65.9	10	65.6	8	59.0	7	56.6
M 7	Inugsuk.....		37	59.5			23	54.9	
	NE. Greenland..		10	68.8			12	57.7	
M 7	Upernavik.....	11	21.7	7	22.0	6	20.8	6	20.0
M 1	Inugsuk.....		27	19.5			19	19.6	
	NE. Greenland..		10	22.2			12	20.7	
M 6	Upernavik.....	14	74.8	11	81.8	8	75.3	6	71.1
M 5	Inugsuk.....		39	72.6			26	75.8	
	NE. Greenland..		10	73.1			12	71.8	

Table 7. *Measurements on the Radius and Ulna.*

			♂			♀			
			R		L		R		L
A. *Radius:*									
	Upernavik.....	2	224.0	3	225.3	2	221.3	3	208.7
M 1	Inugsuk.....		12	223.2			8	202.6	
	NE. Greenland..		6	232.7					
M 3	Upernavik.....	5	20.3	2	20.3	3	17.9	1	18.0
M 2	Inugsuk.....		27	19.6			18	18.5	
	NE. Greenland..		8	21.3			9	18.2	
B. *Ulna:*									
	Upernavik.....	1	235.0	4	235.3			2	221.0
M 1	Inugsuk.....		7	235.9			6	222.7	
	NE. Greenland..		7	247.6			10	222.4	
M 3	Upernavik.....	2	18.7	2	18.5			2	16.4
M 2	Inugsuk.....		16	16.2			10	16.2	
	NE. Greenland..		7	17.8			11	17.6	

from North Greenland, which apparently resemble one another to a considerable extent.

The platymeria is distinctly smaller in Upernavik District than in the other regions, with respect to both males and females.

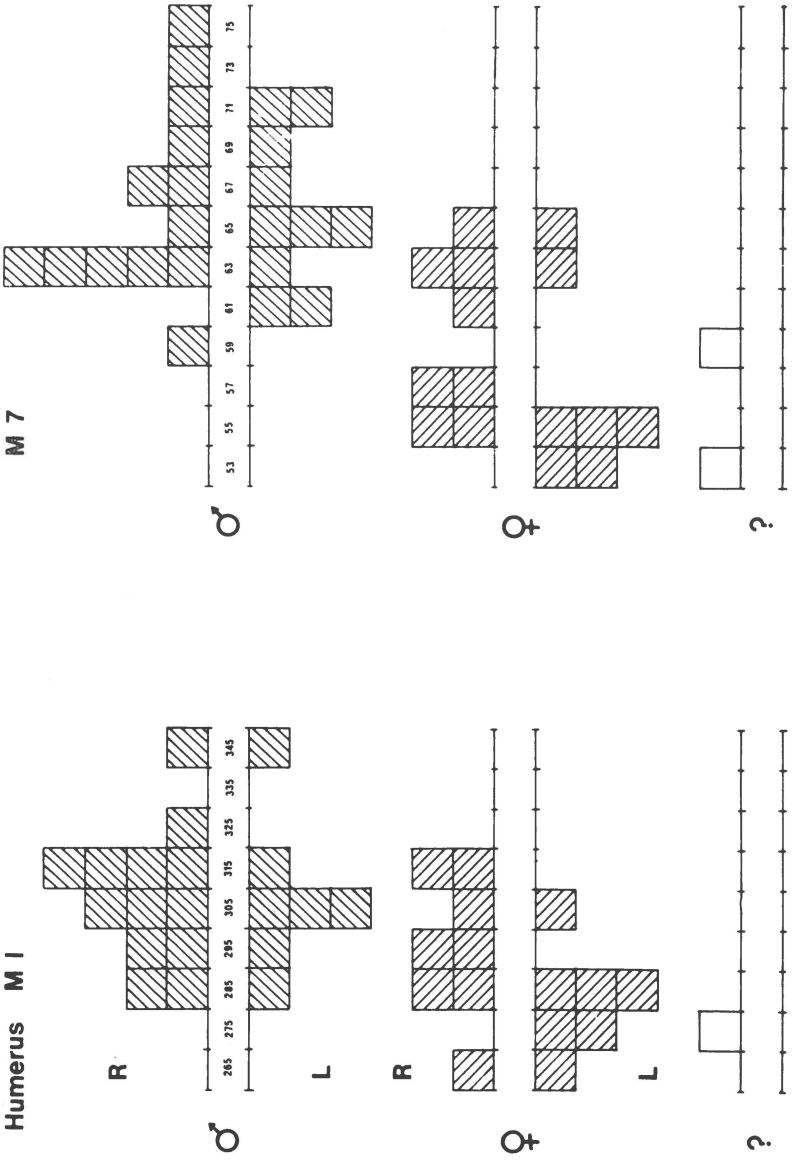


Fig. 3. Distribution of Measurements on Long Bones of Upper Extremity.

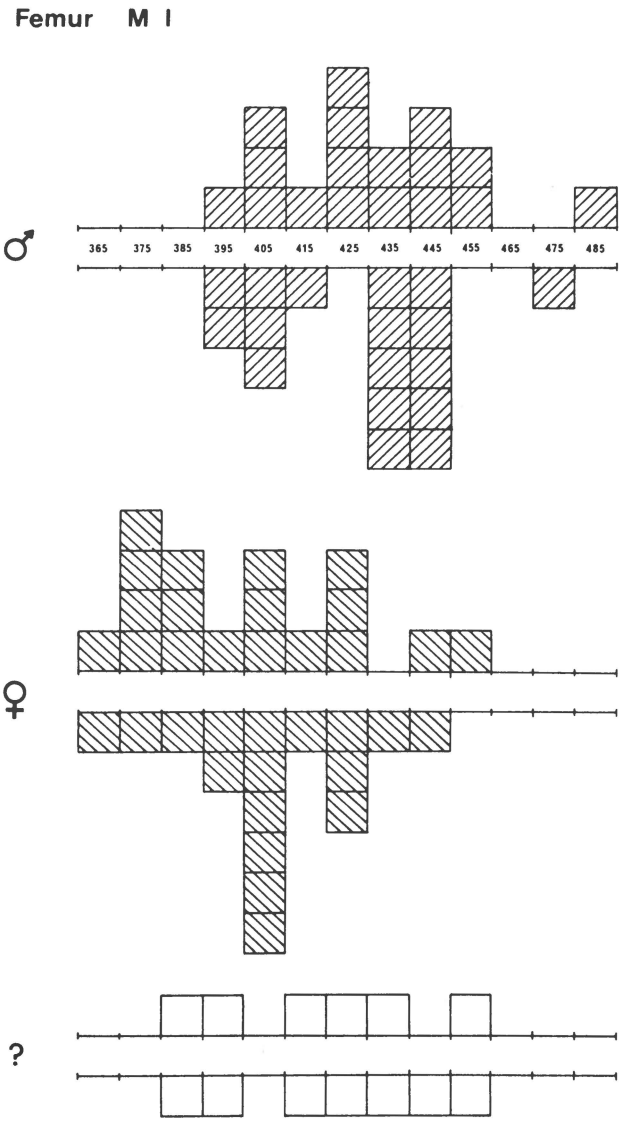


Fig. 4 a.

Fig. 4 a and b. Distribution of Measurements on the *Femur*.

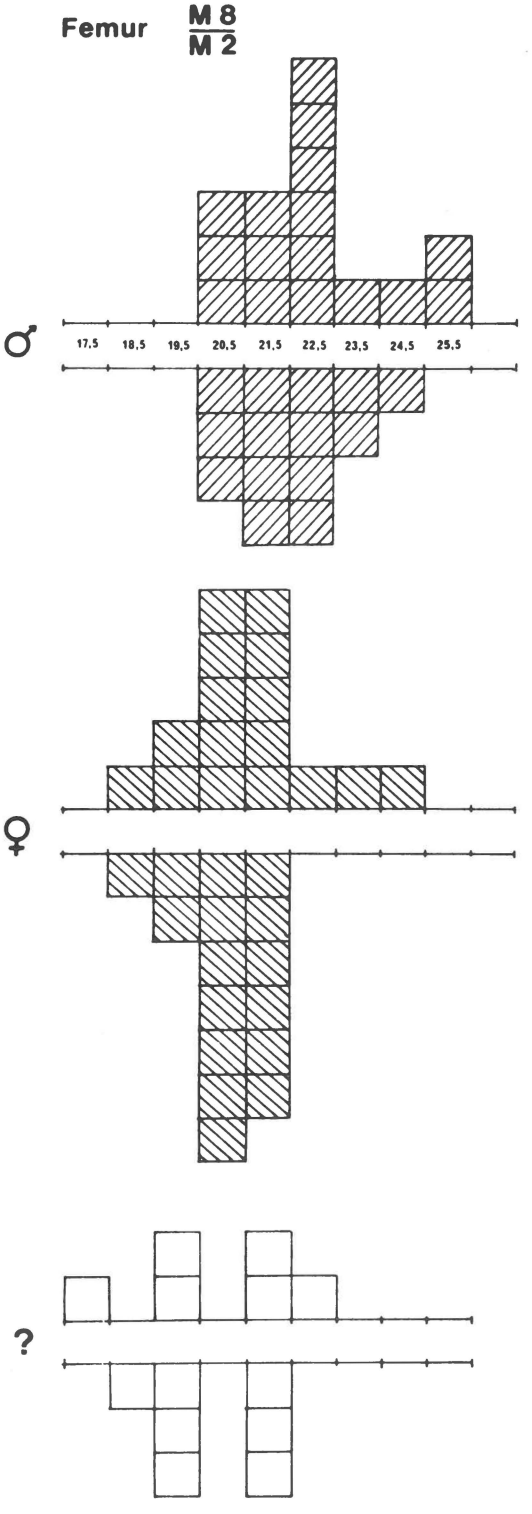


Fig. 4b.

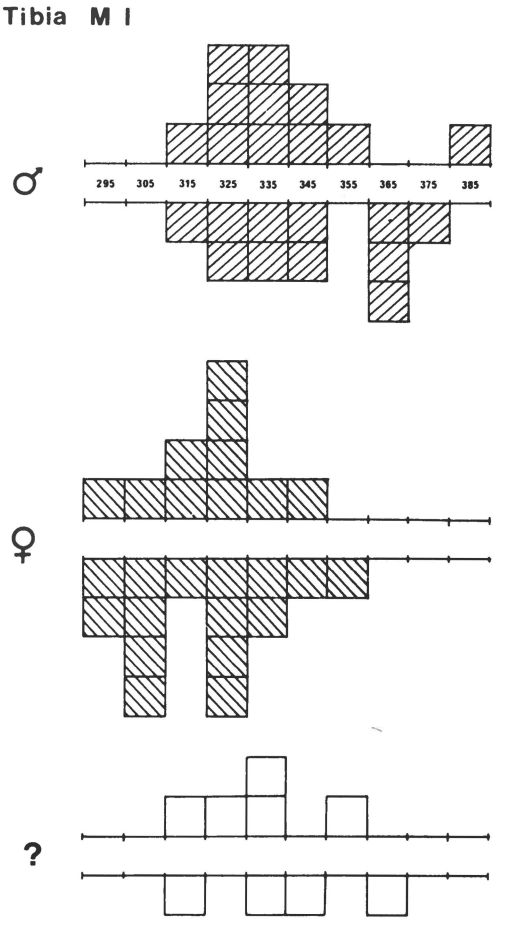


Fig. 5. Distribution of Measurements on the *Tibia*.

Table 8 shows that the length of the male bones from Upernavik corresponds to that of the Inugsuk bones, whereas the female bones correspond to the Northeast Greenland bones. There are no reliable indications of differences as far as robustness is concerned.

Exactly the same considerations apply to the *tibia* and the *femora*. The distribution curves vary in the same way, and the tables show that with respect to the males the length of the Upernavik bones corresponds to that of the Inugsuk bones, with respect to the women, to the Northeast Greenland bones, whereas the robustness is more or less the same in all three materials.

It will also be observed that *index cnemicus* shows a very large variation (60.0–94.0), and that as a result, as in regard to *femora*, this must mean that the validity of the bones' compression must be determined

Table 8. *Measurements on the Femur.*

		♂				♀			
		R		L		R		L	
M 1	Upernavik.....	17	429.6	17	428.5	18	399.7	17	404.8
	Inugsuk.....								
	NE. Greenland..								
M 2	Upernavik.....	16	424.8	16	428.4	18	399.6	19	404.9
	Inugsuk.....		58	421.7			44	388.3	
	NE. Greenland..		7	441.3			9	400.1	
M 8	Upernavik.....	19	94.5	18	95.1	19	82.8	18	83.3
	Inugsuk.....		80	87.8			61	80.7	
	NE. Greenland..		7	93.8			8	84.5	
$\frac{M\ 8}{M\ 2}$	Upernavik.....	16	22.4	14	22.0	16	21.0	16	20.5
	Inugsuk.....		55	20.8			43	21.0	
	NE. Greenland..		7	21.4			9	21.2	
$\frac{M\ 10}{M\ 9}$	Upernavik.....	17	98.4	16	97.3	17	93.2	15	92.0
	Inugsuk.....		73	83.1			59	81.5	
	NE. Greenland..		7	81.7			9	84.5	

Table 9. *Measurements on the Tibia.*

		R		L		R		L	
		♂				♀			
M 1	Upernavik.....	11	336.7	11	344.5	10	319.6	15	318.0
	Inugsuk.....		46	330.6			27	306.7	
	NE. Greenland..		10	363.7			7	325.3	
M 10b	Upernavik.....	12	75.5	9	76.7	9	65.7	15	66.5
	Inugsuk.....		58	70.7			39	64.7	
	NE. Greenland..		10	78.3			10	69.6	
$\frac{M\ 10b}{M\ 1}$	Upernavik.....	11	22.6	8	22.5	9	20,5	12	21.1
	Inugsuk.....		44	21.2			26	21.0	
	NE. Greenland..		10	21.6			7	21.5	
$\frac{M\ 9}{M\ 8}$	Upernavik.....	12	76.0	9	79.0	9	73.2	15	75.0
	Inugsuk.....		61	77.4			41	77.8	
	NE. Greenland..		10	74.8			10	79.3	

with the utmost care. In this case, however, the mean dimensions in the Upernavik material more or less correspond to the mean dimensions in the early material.

Stature:

If we estimate the body heights on the basis of the formulae given by TROTTER & GLESER (1958), we arrive at the following:

	Male	Female
Upernavik	165	153
Inugsuk	165	151
Northeast Greenland	169	154

As anticipated from the absolute measurements on the femora, there are only slight differences.

Conclusion:

As far as both the length and the robustness of the long bones are concerned, the available material reveals no great differences among the three Greenland populations.

The flattening of thigh and shin bones *(platymeri* and *platycnemi)* shows so much variation that this character could provide no enlightenment about the mutual development and relationship of the population groups.

We must point out once more that the very limited amount of materials does not permit extensive conclusions.

Discontinuous Traits

A survey of the frequency of certain morphological variations in the crania, the so-called discontiuous traits, which have the physical-anthropological advantage of being predominantly qualitative, and genetically are believed to be less dependendent on environment than most measurements, follows. Since, in addition, they are selectively valueless, these traits should be well-suited for a genetical characterization of the population. A number of investigations have been satisfactorily carried out on the basis of this view (LAUGHLIN & JØRGENSEN, 1956; BERRY & BERRY, 1967).

It should be emphasized, however, that the relationship between the proposed traits and heredity has by no means been fully clarified, and that neither is there any general agreement as to which traits are the most applicable. In the present work we have chosen to study a considerable number of traits which have proved to be valuable in earlier investigations, but this does not necessarily mean that we therefore want to stress them as definitive. Other materials are available with respect to some of the traits, but for the most part about all that we can do is to submit the materials we now have arrived at for possible use in future investigations.

Table 10 shows the collective frequencies. We have summarized the frequencies for males and females, for the various groups of adults (over 20 years of age), and for the right and left sides. For each single trait we investigated beforehand whether there might be a difference between the sexes, among the age groups, or between the two sides. Differences of this nature were only found in a minority of cases, namely, where there was a question of dehiscence of tympanic bone, temporofrontal articulation, perforation of *fossa olecrani* and *sulcus paraglennoidalis*. It is true of all the rest of the traits that these are the same with respect to both males and females, as well as to the different age groups and the right and left sides.

On the whole, the statistics given in the tables speak for themselves. Yet it is remarkable that temporofrontal articulation is not found at all on the adult crania, nor is there any metopism.

Table 10.
Frequency of Discrete Traits in The Upernavik Series, (Adults).

Supraorbital foramen	80/110	72,7 percent
Multiple infraorbital foramina	14/105	13,3 percent
Multiple mental foramina	4/94	4,3 percent
Temporo-frontal articulation	0/104	0 percent
Epipteric bone	8/85	9,4 percent
Parietal notch bone	16/109	14,7 percent
Tympanic exostosis	0/125	0 percent
Tympanic dehiscence	17/124	13,7 percent
Cribra orbitalis	18/115	15,7 percent
Mylohyoid arch	22/99	22,2 percent
Superior sag. sinus (right)	36/50	72,0 percent
Metopic suture	0/64	0 percent
Inca bone	3/58	5,2 percent
Wormian bones	30/54	55,6 percent
Torus maxillaris	42/63	66,7 percent
Torus palatinus	49/62	79,0 percent
Torus mandibularis	53/59	89,8 percent
Torus maxillaris, pronounced	0/63	0 percent
Torus palatinus, pronounced	2/63	3,2 percent
Torus mandibularis, pronounced	8/59	13,6 percent
Perforatio humeri, males	0/20	0 percent
Perforatio humeri, females	5/14	35,7 percent
Spina bifida	2/15	13,3 percent
Separate neural arch	4/14	28,6 percent
Sulcus paraglenoidalis, males	3/26	11,5 percent
Sulcus paraglenoidalis, females	15/17	88,2 percent

As will be seen in regard to *tori*, the frequency of severe *torus*, as well as *torus* in general, is noted. The reason for this is that consideration was given to comparability with other materials, for obviously there is some uncertainty about what a torus actually is. The considerable frequencies in the available material in relation to other races are remarkable, but are not exceptional for Eskimo populations.

Deformities of the lower spine have earlier been demonstrated as occurring relatively frequently among Eskimos; the present figures correspond to the previous ones, with two cases of *spina bifida* out of 14 investigated ones, and four cases of *spondylolisthesis* out of 14.

In the four cases in which differences between the sexes or among the age groups were found, the material has been further illustrated.

Dehiscence of tympanic bone:

Table 11 shows what the situation is like as far as dehiscence is concerned. It can be seen that this trait is found with much greater fre-

Table 11. *Frequencies of Dehiscences of Tympanic Bones.*

	R			L			R + L		
	M	F	?	M	F	?	M	F	?
Infants + juveniles...	–	–	4/11	–	–	4/11	–	–	8/22
Adults.....	0/9	2/16	0/1	0/9	4/16	0/1	0/18	6/32	0/2
Matures.....	0/14	4/13	0/3	1/13	4/16	0/3	1/27	8/29	0/6
Seniles.....	0/3	1/6	–	0/3	1/6	–	0/6	2/12	–
Uncertain age.....	–	–	0/1	–	–	–	–	–	0/1
Total.....	0/26	7/35		1/25	9/38		1/51	16/73	
Total.....	7/61			10/63			17/124		

M: males, F: females, ?: sex uncertain.

Table 12. *Frequencies of Perforation of Olecranic Fossae.*

	R			L			R + L		
	M	F	?	M	F	?	M	F	?
Infants + juveniles...	–	–	0/2	–	–	0/1	–	–	0/3
Adults.....	0/1	2/3	–	0/2	1/3	–	0/3	3/6	–
Matures.....	0/7	0/3	–	0/7	0/3	–	0/14	0/6	–
Seniles.....	0/1	–	–	0/2	–	–	0/3	–	–
Uncertain age.....	–	1/1	–	–	1/1	–	–	2/2	–
Total.....	0/9	3/7		0/11	2/7		0/20	5/14	
Total.....	3/16			2/18			5/34		

Table 13. *Frequencies of Paraglenoid Fossae.*

	R			L			R + L		
	M	F	?	M	F	?	M	F	?
Infants + juveniles...	–	–	1/3	–	–	1/3	–	–	1/3
Adults.....	1/2	1/2	–	1/4	4/5	–	2/6	5/7	–
Matures.....	0/7	3/3	1/1	1/9	4/4	–	1/16	7/7	1/1
Seniles.....	0/2	–	–	0/2	1/1	–	0/4	1/1	–
Uncertain age.....	–	1/1	–	–	1/1	–	–	2/2	–
Total.....	1/11	5/6		2/15	10/11		3/26	15/17	
Total.....	6/17			12/26			18/43		

quency among women and children than among adult men. Yet differences of this magnitude between the sexes have previously been demonstrated as occurring among the Eskimos, and also in Nubian skeletal material (Ole Vagn Nielsen, 1969).

Table 14.
Frequency of Discrete Traits in different populations (in Adults), (percent):

	Upernavik 1967 (62)	N. W. Greenland (99)	Nigeria (56)	Burma (51)	British Columbia (50)
Supraorbital foramen	72,7	57,1	11,7	13,7	53,0
Multiple infraorbital foramina	13,3	–	6,4	7,5	6,0
Temporo-frontal articulation	0	–	9,8	3,0	1,0
Epipteric bone	9,4	–	16,9	14,7	12,0
Parietal notchbone	14,7	18,6	6,2	7,8	10,0
Metopic suture	0	–	0	0	2,0
Torus palatinus	79,0	37,0	0	0	2,0
Torus palatinus pronounced	3,2	–	–	–	–
Torus mandibularis	89,8	61,1	–	–	–
Torus mandibularis pronounced	13,6	–	–	–	–

In regard to children, part of the explanation of the great frequency is probably that the majority of the children in this material are infants, and that at this period *os tympanum* normally is not fully developed.

Temporo-frontal articulation:

Temporo-frontal articulation could be investigated in 25 adult men and 27 adult women, and was not found in any of the cases.

One juvenile female skull showed temporo-frontal articulation on the right side, but not on the left.

Out of seven skulls of children, one showed *temporo-frontal* articulation on both sides.

Perforatio fossae olecrani:

Perforatio fossae olecrani (table 12) was not found on a single male skeleton, but was not rare on the female *humerii.* This is also true of *sulcus paraglenoidalis* on *os coxae*, which was found on practically all of the female pelvises, but only in a few cases on the male pelvises.

For the purpose of comparison with the material investigated here, the results of earlier investigations of other series are shown in the final table in this chapter (table 14). This concerns Northwest Greenland crania investigated by LAUGHLIN & JØRGENSEN in 1956, and crania from Nigeria, Burma, and British Columbia, investigated by BERRY & BERRY in 1967.

Supraorbital foramen and multiple infraorbital foramina:

Supraorbital foramen and *multiple infraorbital foramina* occur in this recently investigated material in very high frequencies as compared to the non-Eskimo people, whereas in earlier investigations of Northwest Greenland crania, which moreover also stem from Upernavik District, high frequencies, if not as high as the present ones, were found to occur.

Temporo-frontal articulation:

No *temporo-frontal* articulation was found in the recently investigated material, and occurred quite rarely in the mongoloid groups in British Columbia and Burma, but somewhat more frequently in the African material.

Epipteric bone:

The occurrence of *epipteric* bone does not appear to be different in the series investigated here; this is also partially true of the occurrence of *parietal notchbone*, although the two Greenland materials are a bit higher than the rest.

Tori is extremely characteristic of both Greenland materials, but we have no comparative statistics at hand, and, as mentioned above, comparisons are particularly difficult.

Pathological changes

As mentioned below, pathological changes were observed on the skeletal materials; one does not, however, dare to embark on any detailed diagnosis of the individual cases. In the first place, a diagnosis of this kind is extremely difficult and far less reliable than commonly assumed; secondly, in this connection the small size of the population does not, after all, permit any attempt at a statistical analysis of the extent to which the disease occurred.

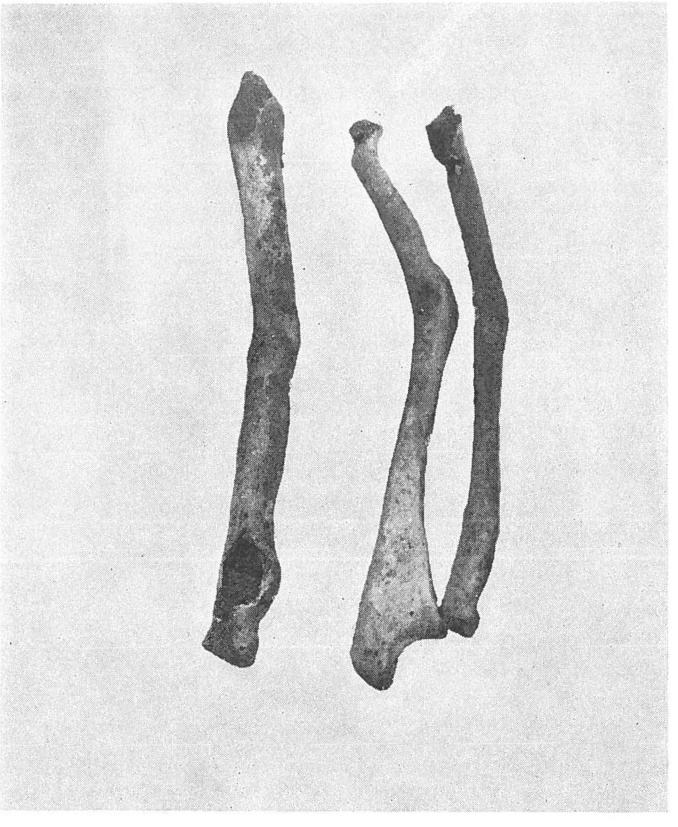


Fig. 6. Fractures of *antebrachium* and of *radius*.

Fig. 7. *Metastatic tumor.*

Apart from cases of *spina bifida* and separate neural arches which are mentioned on p. 26, characteristic *congenital* deformations have not been found. Yet the size of one of the skeletons is so small, that dwarfisme actually could come into the question. This is skeleton no. 62, whose body height is calculated in accordance with the customary tables at 140–145 cm. Since the skeleton's proportions are normal, if a pathological condition exists, it probably has endocrinological causes. The cranium is normal, and there are no indications of hypophyseal changes.

Traumatic lesions occur in several cases, such as fractures of the *radius*, the clavicle, the forearm (fig. 6). and the first *lumbar vertebra*. The broken *vertebra* must have caused considerable invalidity, since there are severe *arthritic* changes in the vertebral column around the broken area.

Infectious diseases were not demonstrated, except for heavy cases of infectous necrosis around the roots of the teeth (figs 8 and 9).

Distinct processes of decay, indicating spreading of a *malignant tumor*, was found on one cranium. The primary tumor cannot be localised

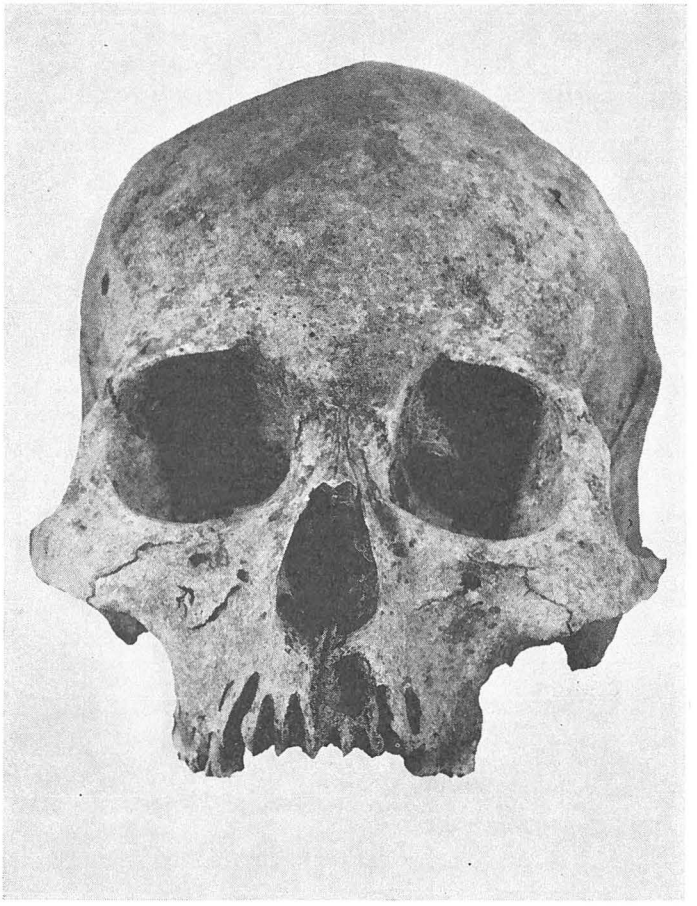


Fig. 8. *Perialveolar* abscess in *maxilla.*

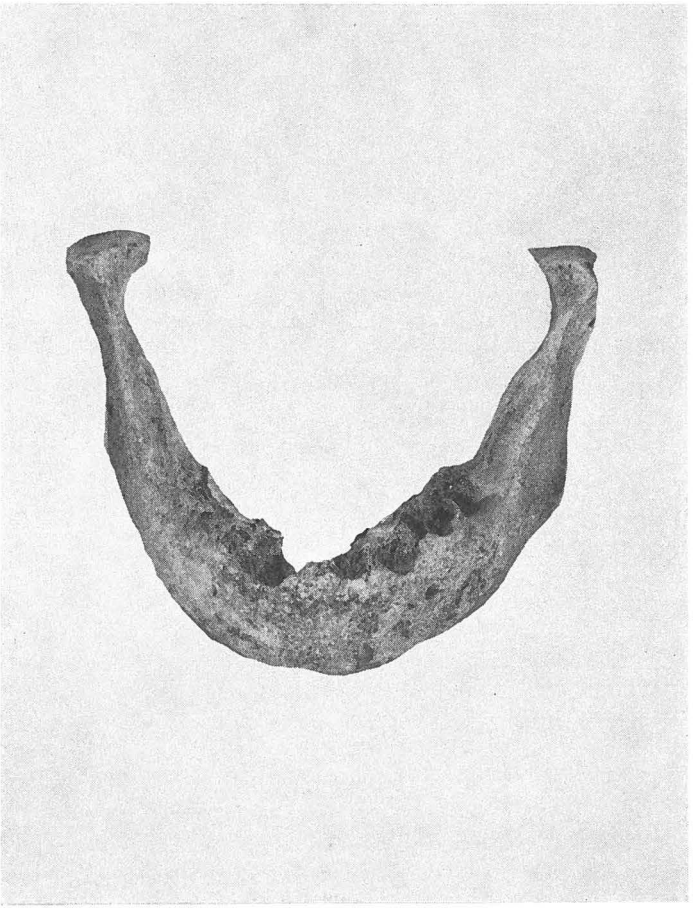


Fig. 9. *Perialveolar* absces in *mandible.*

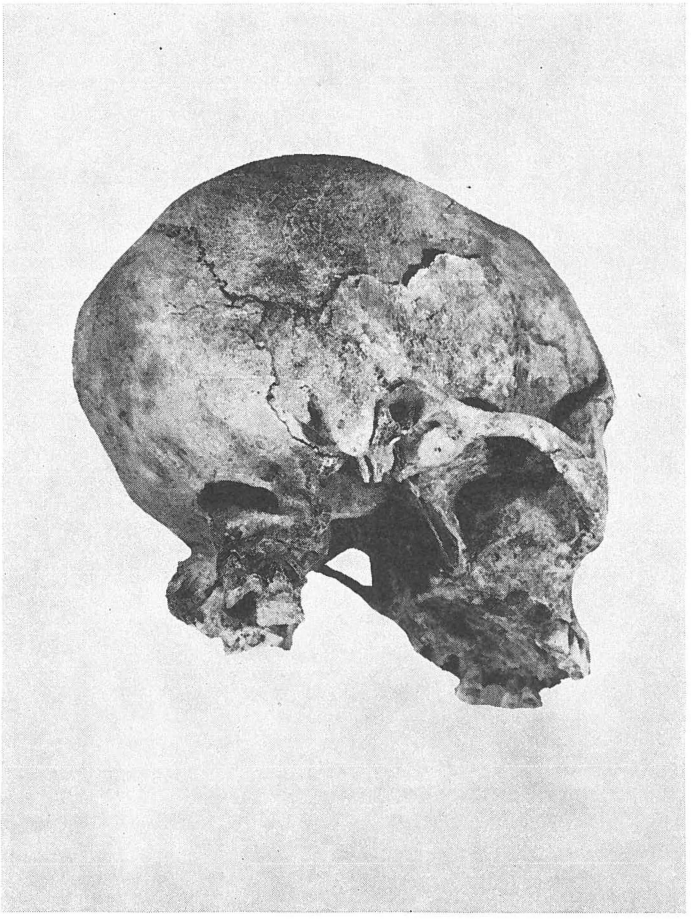


Fig. 10. *Synstosis* between upper vertebrae and *occipital* bone.

but since this concerns a female, the *mamma* or the *cervix uteri* are the most probable (fig. 7).

Degenerative diseases *(osteoarthritis)* are observable on practically all of the skeletons of adults past early youth. Hence, more severe cases occur in the shoulder joints of two persons, in the elbow joints of five, in the hip joints of two, and in the knee joints of four persons.

The most severe changes occur in the vertebral column, six of which are heavily deformed. The disease is not solely localized to the vertebral body and the articular discs *(disci)* between them, but the small joints between the articular processes are severly changed too, so much so that in four cases the vertebrae in the cervival spine are adhesed, and in two cases the first cervical vertebra is adhesed to the lower part of the crania (fig. 10).

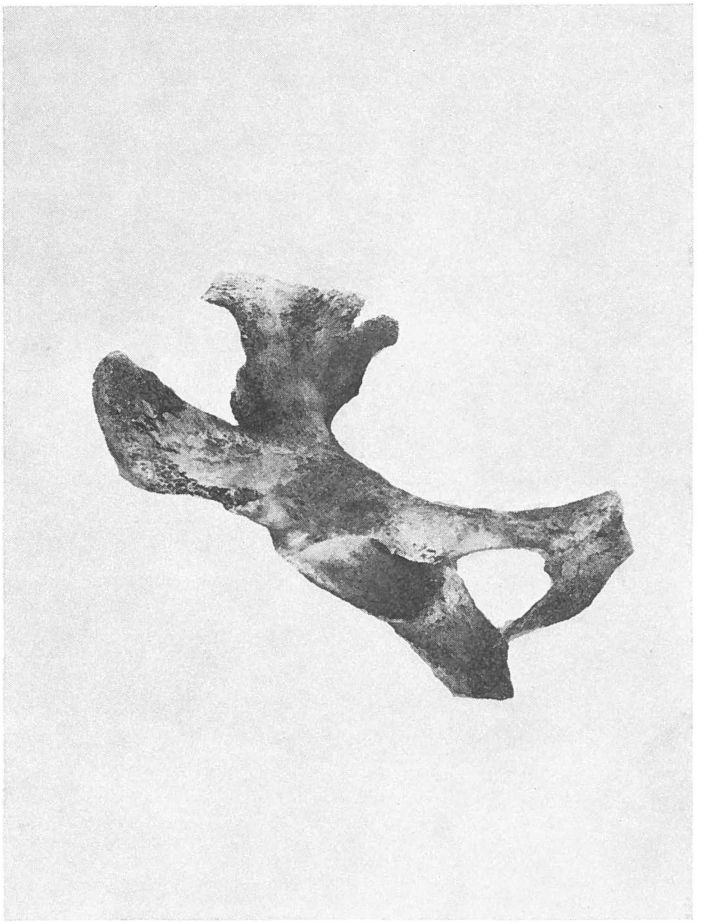


Fig. 11. *Synostosis* of right sacroiliac joint.

Two other cases show complete adhesion of the *sacrum* and the two hip bones (fig. 11).

Corresponding to these rheumatic changes in the joints, several skeletons show traces of this disease also having attacked the soft parts of the body, *i.e.* sinews and muscles. This is revealed by irregular projections on the bones, corresponding to the insertion of the muscles and sinews.

All in all, in common with other primitive peoples, this small group of people suffered severely from rheumatic diseases *(arthrosis—spondylosis)*. Broken bones and backs also occur, which also is not unusual in a people of this type. More amazingly, one case was found to have what is inferred to be a spreading of a *malignant tumor (cancer—metastasis)*.

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