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Population of Nubia up to the 16th century BC

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ABSTRACT The article presents anthropological characteristics (morphological features, paleodemography and paleopathology) of the population inhabiting Nubia from the end of the Upper Palaeolithic till the 16th century BC. The material basis for this work consisted of the collections of bones coming from the archaeological researches carried out in Nubia.

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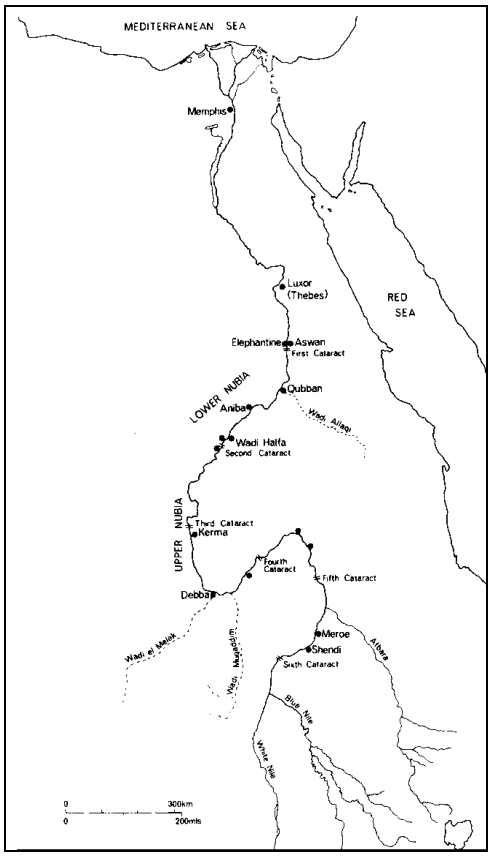
Introduction

The very term *Nubia* was not known in the ancient times. For the first time it was mentioned by Eratosthenes (3rd century BC) and then cited by Strabo (1st century BC) who used this term to describe the Noba tribes living south of the first cataract on the Nile. The northern border of Nubia was described very precisely; it was marked by the first cataract, while to the south it extended as far as the city of Khartoum. In my article I use the term *Nubia* to refer only to the geographical region (Map 1).

Ancient Nubia (the historical land of Sudan) was a region of intensive human activity, and hence a scene of significant changes occurring in the physical traits of its population. Geographical location (vicinity of a powerful northern neighbour – Egypt), climatic changes, limited arable area, as well as socio-cultural factors influenced the economy of the population inhabiting this region from the Upper Palaeolithic till the 16th century BC.



Map 1. Nubia

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Table 1. Correlation between the climatic conditions of East Africa and the Sudan [JACKSON 1971]

Year BC	Geological Stages	East Africa	The Sudan
1500		Dry period	
2200		----------	
3300			Late Neolithic; dry climate escalates
4500		Makalian wet period	Neolithic; rainfall in Khartoum ca. 500 mm
5500	Epi-Pleistocene		
8000			Mesolithic; rainfall in Khartoum probably up to 700 mm
10000		Dry period ----------	Final formation of large sand dunes e.g., in Kordofan
20000	Upper Pleistocene	Gamblian pluvial	Formation of the Gezira plain with rainfall in excess of 700 mm

Table 2. The cultural sequence in Egypt and Nubia

Year BC	Egypt	Lower Nubia	Upper Nubia
1070	Fall of New Kingdom		
1450			Fall of Kerma
1550	New Kingdom	Fall of C-Group	Late Kerma
1600	2nd Transition Period		Classic Kerma
2000	Middle Kingdom		Middle Kerma
2200	1st Transition Period	C-Group	Ancient Kerma
2500	Old Kingdom		
2900	Protodynastic	Late A-Group	Pre-Kerma
3100	Predynastic Late Nagada III	Classic A-Group	
3500	Nagada II	Early A-Group	
4000	Nagada I		
12000		Qadan	

From the end of the Upper Palaeolithic and Mesolithic the earliest population of Nubia (12,000-8,000 BC) was involved in hunting-gathering for subsistence. At that time climatic changes consisting in the climate becoming increasingly drier made the life in that region difficult and forced people to constant movement in attempt to adapt to the changing conditions. (Table 1). The population under study belonged to the cultural group called *Qadan* (Table 2). In the Neolithic period (about 5,000 BC) considerable changes took place in the methods of food acquisition. Since then the population of Nubia turned to the cultivation of crops and breeding of livestock. However, despite the settled life style the general social conditions did not improve. This period is characterised by cultures from *A-Group* and *C-Group* (Lower Nubia – region of the 1st and 2nd cataracts), *Kerma* (Upper Nubia – region of the 3rd cataract), and *Pan-Grave* – originally nomadic hunters-gatherers [STROUHAL 1982]. All of the above-mentioned ecological conditions as well as the geographical location of Nubia influenced both the age and sex structure of the people inhabiting that region and not only defined the population but also shaped its morphology.

Materials and methods

The material consists of the collections of bones coming from the archaeological researches carried out in Nubia mainly in the region of the 1st and 4th Nile cataracts by American Expeditions [ANDERSON 1968; GREENE, ARMELAGOS 1972; COLLETT 1933], Sudan Antiquities Service [ARKELL 1949, 1953], Egypt Exploration Society [BATRAWI 1935]; Scandinavian Joint Expedition to Sudanese Nubia [NIELSEN 1970]; Anthropological Mission founded by UNESCO [STROUHAL, JUNGWIRTH 1984]; Italian Expedition [COPPA, MACCIARELLI 1983]; Polish Expedition [DZIERŻYKRAY-ROGALSKI 1977, 1978*a*, *b*], and French Expedition (SFDS 1994) [BONNET 1981–95, 1991].

All of the collected data concerning the age, sex-distribution, body height, pathology and mean neurocranial measurements (according to nine classical indices [MARTIN, SALLER 1957] such as cranial index; length-height index; breadth-height index; transversal fronto-parietal index; facial index; Kollmann's upper facial index; Virchow's upper facial index; orbital index and the tables of mean values of these indices) as well as tables of neurocranial non-metric traits and postcranial measurements were used in the analysis of the population inhabiting the Sudan between 12,000 and 2,000 BC [e.g., CARLSON 1976; SMITH, JONES 1910; STROUHAL 1973, 1984].

A very precise and detailed description of the earliest population of Nubia could not be made due to insufficient number of series available. Nevertheless, the material gathered was a basis for the creation of a general picture of this population.

Paleodemographic characteristics

In the Upper Palaeolithic and Mesolithic the mortality among children up to 15 years of age was rather high (Table 3), reaching up to 30 % of this group, while for adults the highest mortality rate (44%) occurred in the group between 22 and 35 years of age (Table 4). No individuals of 50 or more years of age were identified in the bone material.

Table 3. Age-distribution of immature skeletons from Nubia

Category	Upper Palaeolithic Mesolithic		Neolithic		A-Group		C-Group		Kerma	
	N	%	N	%	N	%	N	%	N	%
infans I			29	61.7	11	78.6	53	54.1	28	30.1
infans II	24	80.0	10	21.3	1	7.1	22	22.4	35	37.6
juvenis	6	20.0	8	17.0	2	14.2	23	23.5	30	32.3
Total	30	100.0	47	100.0	14	99.9	98	100.0	93	100.0

Table 4. Age-distribution of adult skeletons from Nubia

Category	Upper Palaeolithic Mesolithic		Neolithic		A-Group		C-Group		Kerma	
	N	%	N	%	N	%	N	%	N	%
adultus	36	61.02	61	59.80	110	74.32	403	71.96	56	21.96
maturus	17	28.81	31	30.39	23	15.54	127	22.68	134	52.55
senilis	-	-	2	1.96	15	10.13	30	3.36	65	25.49
Total	59	100.0	102	99.99	148	99.99	560	100.0	255	100.0

From the Neolithic on the structure of age and sex did not undergo significant changes. Among children the highest mortality rate was noted among infants; death of older children was less frequent. Only in the period of the *Kerma* culture was this rule unsettled. The mortality rate at that time was the same for children of all ages, which might have resulted from an improvement in the living conditions of the population. The death rate for adults in given categories from the Upper Palaeolithic till the *C-Group* period remained unchanged (Fig. 1). The highest mortality rate occurred in the *adultus* category (20–30/35), to decrease in the category of *maturus* (30/35–50/55). A very low percentage of the population reached the age exceeding 50/55 years (*senilis* category), which can be attributed to severe climatic conditions. In the period of the *Kerma* culture the highest mortality rate occurred in the *maturus* category. Also in the *senilis* category the mortality rate was high, which may be a reflection of an improvement in living conditions.

The sex structure was uniform across all periods. The mortality rate for women was the highest in the *adultus* category and was closely connected with postpartum complications. However, in both *maturus* and *senilis* categories there were more men than women.

Analysis of somatic characteristics

Reconstruction of the body height according to the method of Trotter and Gleser [BROTHWELL 1963] as well as with the use of Pearson's method [PEARSON 1899] provides us with the evidence that the population of ancient Nubia was high-statured (Table 5). However, from the Neolithic on a decrease in the body height of that population was noticed, probably due to the influx of people from other regions. Despite that, till the Late Neolithic the average height of male individuals was over 170 cm (Fig. 2).

It is worth noting that if we assume that the population under study was Caucasoid their average height will be higher than if we assume its affiliation with the Negroids (Fig. 3).

Pathological changes

The population of hunters-gatherers was characterised by pathological changes such as strong dental abrasion (due to the

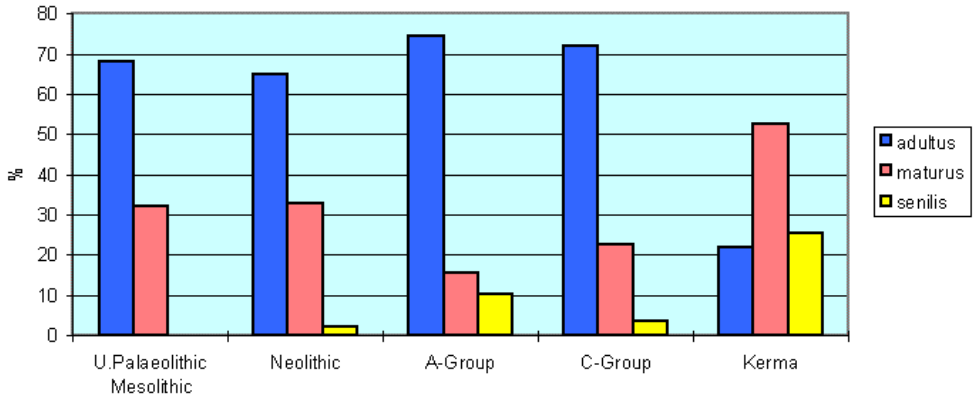

Fig. 1. Age-distribution of adult skeleton

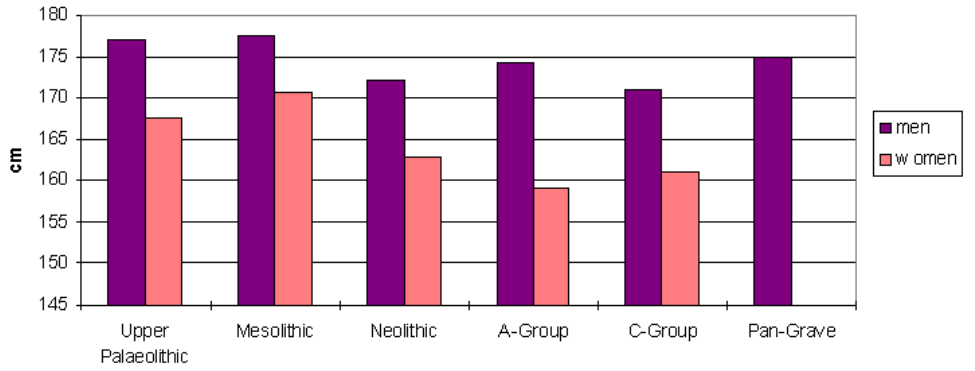

Fig. 2. Mean hight of Nubian population according to sex

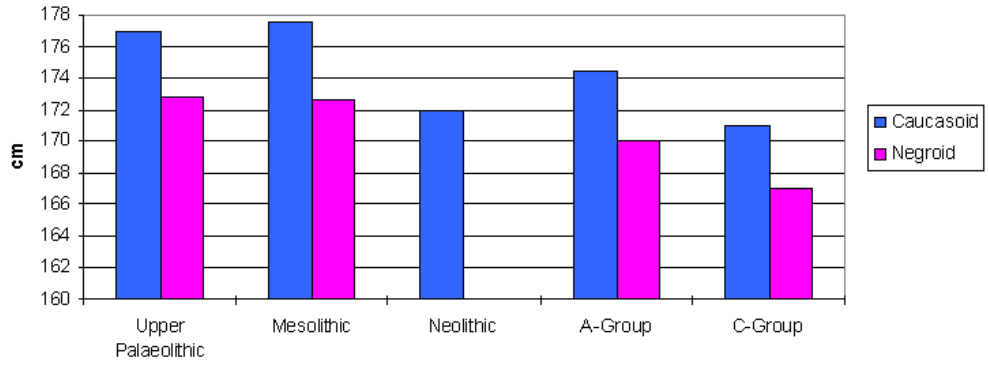

Fig. 3. Mean height of Nubian population according to Causasoid and Negroidal traits

presence of large amounts of grit in the diet [GREENE *et al.* 1967]) and a low incidence of caries (in the Mesolithic it was only 1 %) and dental abscesses. However, in the Neolithic we observe an increase in the incidence of dental diseases. During this period due to the transition to the cultivation of crops and the livestock breeding the population's diet changed. This modification led to the growing incidence of dental abscesses, caries (among the *Pan-Grave* people caries was low), loss of teeth, tartar build-up and parodontosis, especially among the *C-Group* populations.

The population of ancient Nubia from the Upper Palaeolithic up to the 16th century BC was characterised by typical pathological changes arising from the changes in climatic conditions and a specific life style of this region (in spite of the changes that took place in the economy of this region in the Neolithic). Among the most important typical pathological changes identified in the Nubians there were fractures of long bones, spondylosis, osteo-arthroses, osteo-arthrothic conditions, and *ciriba orbitalia*, the last one occurring only among the people within the *C-Group*.

Morphological characteristics

In the Upper Palaeolithic and Mesolithic the people of Nubia were robust and tall (stature above 170 cm). Their bones were robust with strong muscle attachments. They had long skulls with prominent supraorbital region, temporal lines forming raised ridges. Their faces were low and broad with large projecting zygomatic arches and low rectangular orbits, broad nose and prognathism. Mandibles of those people were generally massive with gonial eversion and prognathism.

In the Neolithic the picture of a typical Nubian underwent transformations. The Nubians became less robust and shorter. Their skull remained long, well acrocranial, with prognathism, but the facial shape changed, becoming longer, with narrower nose.

People of *A-Group* were characterised by dolichocephalic, medium-high (or, in the case of male individuals, low) skulls, medium-acrocranial with medium-broad (in the case of females – narrow) brow. As for the face, it was medium-broad, with long and narrow upper part, with broad or medium-broad nose and medium-high (to high in the case of females) orbits.

Similarly, people belonging to *C-Group* were characterised by long or medium-long skulls with medium-high and medium-acrocranial, medium-broad brow with narrow and long or very longlines forming raised ridges. Their faces were low and broad with large projecting zygomatic arches and low rectangular orbits, broad nose and prognathism. Mandibles of those people were generally massive with gonial eversion and prognathism.

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Table 5. Maximum length of long bones (number of bones in brackets)

	Humerus		Radius		Femur		Tibia	
	m	f	m	f	m	f	m	f
Upper Palaeolithic	328.7 (3)	319.5 (2)	274.0 (4)	250.0 (3)	475.0 (5)	443.0 (1)	407.4 (5)	370.0 (1)
Mesolithic	316.6 (3)	–	269.4 (5)	247.4 (3)	460.5 (4)	437.6 (6)	402.0 (3)	350.0 (3)
A-Group	324.6 (25)	297.4 (27)	257.2 (24)	233.0 (24)	466.5 (15)	420.5 (23)	387.4 (22)	351.6 (21)
C-Group	318.8 (50)	305.5 (61)	251.1 (56)	225.5 (56)	450.7 (108)	429.3 (100)	383.3 (55)	371.1 (56)
Pan-Grave	314.5 (4)	–	259.6 (3)	–	469.6 (5)	–	389.8 (6)	–

Table 6. Cranial indices of males in the series from Nubia

	cranial	length-height	breadth-height	fronto-parietal	upper facial	upper facial Virch.	facial	orbital	nasal
Upper Palaolithic	70.3 (14)	68.4 (9)	96.2 (9)	–	50.3 (6)	–	84.8 (7)	71.1 (13)	59.7 (8)
Mesolithic	72.86 (4)	–	–	–	46.38 (2)	–	–	73.27 (3)	55.30 (2)
A-Group (2 - cat.)	73.68 (6)	72.28 (6)	98.13 (6)	70.28 (6)	52.68 (3)	74.9 (3)	86.38 (3)	81.48 (4)	54.8 (4)
A-Group (1 - cat.)	71.5 (43)	73.2 (40)	100.1 (39)	69.6 (39)	55.3 (28)	–	90.2 (14)	83.6 (38)	50.4 (36)
C-Group (2 - cat.)	73.70 (53)	74.09 (44)	100.65 (40)	69.39 (48)	53.17 (16)	73.11 (34)	87.41 (12)	82.74 (12)	51.38 (44)
C-Group (1 - cat.)	73.2 (61)	72.2 (60)	101.4 (60)	69.2 (64)	55.3 (40)	–	92.0 (18)	81.2 (55)	51.6 (54)
C-Group (1-2 cat.)	76.14 (7)	71.92 (5)	94.18 (6)	69.86 (7)	57.47 (3)	76.77 (3)	94.63 (3)	77.25 (4)	51.9 (4)
Pan-Grave	70.6 (5)	71.78 (5)	101.86 (5)	69.68 (5)	54.23 (3)	72.43 (7)	92.03 (3)	77.78 (6)	55.56 (7)
Kerma	72.2 (133)	72.4 (91)	100.6 (91)	–	–	–	–	78.6 (113)	51.8 (105)

Table 7. Cranial indices of females in the series from Nubia

	cranial	length-height	breadth-height	fronto-parietal	upper facial	upper facial Virch.	facial	orbital	nasal
Upper Palaolithic	71.0 (14)	70.4 (4)	100.9 (4)	–	47.0 (2)	–	78.0 (2)	72.3 (8)	61.4 (4)
Mesolithic	73.79 (7)	–	–	–	48.36 (4)	–	----	72.26 (8)	54.32 (6)
A-Group (2 - cat.)	73.43 (10)	72.73 (6)	98.17 (6)	67.81 (9)	51.85 (2)	72.05 (2)	86.9 (1)	83.85 (6)	56.8 (6)
A-Group (1 - cat.)	73.8 (21)	72.6 (19)	97.9 (19)	68.5 (22)	57.2 (15)	–	94.4 (8)	87.6 (20)	49.4 (20)
C-Group (2 - cat.)	74.3 (63)	74.15 (42)	100.46 (42)	69.87 (56)	55.7 (22)	72.88 (37)	90.9 (14)	84.9 (43)	51.51 (42)
C-Group (1 - cat.)	75.4 (66)	74.3 (61)	101.1 (59)	69.4 (66)	56.0 (38)	–	92.5 (23)	83.7 (50)	53.3 (52)
C-Group (1-2 cat.)	77.62 (5)	74.53 (3)	94.04 (3)	68.08 (4)	56.4 (1)	75.55 (2)	91.1 (1)	84.13 (4)	46.93 (3)
Kerma	73.3 (112)	72.4 (88)	101.9 (88)	–	–	–	–	81.6 (83)	53.4 (85)

with long and narrow upper part, with broad or medium-broad nose and medium-high (to high in the case of females) orbits.

Similarly, people belonging to *C-Group* were characterised by long or medium-long skulls with medium-high and medium-acrocranial, medium-broad brow with narrow and long or very long(in females) face and medium-broad or narrow upper face, medium-broad or narrow (in females) nose and medium-high or high (in females) orbits.

On the other hand, the male population of the *Pan-Grave* was characterised by dolichocephalic, medium-high skulls, medium-acrocranial with medium-broad brow, long and narrow face and medium-broad upper face with considerable prognathism. They had broad noses and medium-high orbits.

People belonging to the *Kerma* culture were characterised by long or medium-long and medium-high skulls, well acrocranial with medium-high or high face and medium-broad or broad nose and medium-high orbits, with prognathism.

Thus, over the period of 8,500 years the features of both male and female skull changed to a considerable degree. The length of the skull remained almost the same, but its height increased. The face changed from short and broad into long and narrow. The orbits changed from low to high and the nose from broad to narrow.

Despite the fact that all those changes were uniform for both male and female individuals they did not occur at the same time. The diversity was more distinct among women (Tables 6 and 7)

The variety of morphological forms, which occurred in Nubia, resulted from the combination of the Caucasoid and Negroid traits. The influence of the Mongoloid race traits was also present. It was only minor but should not be neglected.

From the Neolithic on, or possibly even earlier, the strategic location of Nubia, promoting contacts between various populations, started to bring about effects in the form of the civilizational development of this region. Finally, these two factors led to the Hamitisation process, whereby superimposition of the Caucasoids on the Negroids took place.

Comparative analysis

On the basis of the average indices of the skulls from the Nubian series as well as from African [*Kultura* 1974; ANDERSON 1968; WIERCIŃSKI 1963; MICHALSKI 1963] and Asian series [WIERCIŃSKI 1965], the comparison analysis performed with the use of Czekanowski's diagraphic method showed strong similarities between the Upper Palaeolithic and Mesolithic population of Nubia and the present-day Hottentot and Bushmen populations inhabiting Southeast and South Africa. Hottentot and Bushmen people are considered to be the oldest African populations, which came into being most probably in the Upper Palaeolithic (40,000-20,000 BC), inhabited savannahs and semi-deserts across the entire African continent including the territory of the present-day Sahara and were subsequently forced to migrate south by pastoral tribes. Thus, it is very likely that the Upper Palaeolithic population of Nubia derives from the indigenous African population. The Mesolithic series also shows significant similarities to Northwest Africa (Toforalt, Afalou) and to predynastic series from Upper Egypt (Abydos, Naqada).

Starting from the Late Neolithic (*A-Group, C-Group, Kerma*) similarities between the Nubians and the populations of Northeast Africa (Maadi, Wadi Digla, Badari, Abydos, Naqada) and Asia (Ur,

Hissar II, Turkestan; modern Indian groups Dravidians, Tamils, Kolarians) became even more distinct, which may prove the existence of strong ties derived probably from influx of the Caucasoids from the regions of Levant, Mesopotamia, and India. They were coming to Nubia through the Sinai Peninsula, but probably also through the south Saudi Arabia. The Kerma series from Upper Nubia shows particular similarities to the present-day Indian series.

The Late Neolithic series are also related to Northwest Africa (Mechta el Arbi, Asselar) and to the present-day Western Africa (Gabon, region of the Congo River). This fact should be most probably associated with the influx of the Mesolithic population of the Mechta type from Northwest Africa.

Conclusions

1. The population of ancient Nubia lived under very difficult conditions, which was reflected in its mortality characteristics with the highest death rate among infants and young women, very low frequency of cases of longevity, as well as in pathological changes typical of populations involved in hunting-gathering, cultivation of crops and livestock breeding for subsistence. Climatic factors had a very strong impact on these changes.

2. The Nubians were hardly a homogeneous population. Neither the climate nor the specific geographic conditions in the region they inhabited were conducive of such homogeneity. The population of Nubia was shaped by several migration waves coming from Northwest Africa and from Asia through Sinai and Yemen. All those population movements gained on intensity in the Neolithic, but they did not prevent repeated contacts of the people of Nubia with Southern Africa.

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Streszczenie

Starożytna Nubia była terenem intensywnych działań ludzkich w okresie między 12 a 2 tys. p.n.e. Szczególne położenie geograficzne (Afryka północno-wschodnia), zmiany klimatyczne takie jak osuszanie się klimatu, które zmuszały do ciągłych wędrówek i nieustannego szukania sposobu na przystosowanie się do panujących warunków oraz istotne zmiany w metodach zdobywania pożywienia (przejście gospodarki zbieraczo-;owieckiej na rolniczo-budowlaną) zdeterminowały strukturę wieku i płci żyjącej tam ludności, określiły także typ zmian patologicznych najczęściej występujących w tej populacji i wpłynęły na jej szeroko pojętą morfologię.

Surowe i niebezpieczne warunki życia przyczyniły się do dużej wymieralności najmłodszych dzieci populacji nubijskiej, młodych kobiet (zapewne związana z powikłaniami popołogowymi) i małej dożywalności do późnego wieku. Wśród zmian patologicznych występowały liczne zmiany pourazowe, degeneracyjne, zwyrodnieniowe kręgów, zapalenia stawów oraz charakterystyczne dla gospodarki zbieraczo-łowieckiej: wysokie starcie koron zębowych, niski procent próchnicy i infekcji przyzębnych, oraz późniejszej rolniczo-hodowlanej: zwiększenie występowania próchnicy, ubytków, paradontozy i kamienia nazębnego.

Przez około osiem i pół tysiąca lat obraz czaszki męskiej i żeńskiej znacznie się zmienił: stała się mniej masywna, długość mniej więcej pozostała ta sama, natomiast jej wysokość wzrosła, twarz z niskiej i szerokiej stała się długa i wąska, oczodoły z bardzo niskich wysokie, a nos z szerokiego wąski. Mimo wspólnych zmian, wśród osobników męskich i żeńskich, zmiany te nie zachodziły jednocześnie. Większe zróżnicowanie zauważalne jest wśród kobiet.

Różnorodność form morfologicznych, które występowały na terenie Nubii jest wynikiem ścierania się wpływów odmiany czarnej i białej, przy niewielkim udziale odmiany żółtej. Od neolitu (być może nawet wcześniej) ważne strategicznie położenie terenów Nubii ułatwiło ludności kontakty i rozwój cywilizacyjny, co spowodwało proces chamityzacji, czyli nałożenia się odmiany białej na odmianę czarną.

Ludność ta na pewno nie była jednorodną populacją, złożyły się na nią kolejne fale migracyjne, napływające z Afryki północno-zachodniej, przede wszystkim z zachodniej Azji, przez Synaj oraz Jemen. Owe ruchy ludnościowe w okresie neolitu znacznie nasiliły się, nie zmniejszając przy tym powtórnych kontaktów z południową Afryką.