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PRECOLUMBIAN HUMAN SKELETAL REMAINS FROM CURACAO, ARUBA, AND BONAIRE

SUMMARY

The studies on the skeletal remains of the Dutch Leeward Isles are reviewed. They comprise skeletal remains from preceramic as well as from ceramic sites. The preceramic sites are the Michielsberg (Curaçao) and Ceru Canashitu and Malmok (Aruba); the ceramic sites comprise De Savaan (on Curaçao), Bonaire and sites with urn-burials on Aruba (Ceru Noka and Sabaneta). Preservation was poor in next to all cases; it greatly limited the number of observations. Notwithstanding this, a clear distinction emerged between skeletons of the preceramic group and the ceramic group. Skeletons of the first group are far more robust than those of the latter group. This applies also to the masticatory apparatus. The skulls from the preceramic skeletons are dolichocran and certainly 'high' with regard to the breadth, whereas the skulls from the ceramic group are strongly brachycran and 'low' as compared to the breadth.

C14 datings were obtained from each site either on bone or on shell-material; datings range from about 3800 B.P. to about 1800 B.P. for the preceramic sites and from about 1000 B.P. to 660 B.P. for the ceramic sites.

INTRODUCTION

The earliest mention of Indian skeletal remains from these islands goes back to the beginning of this century, when Koeze (1904) reported on skeletal remains from Aruba (3 individuals) and Curaçao (1 skull). All material was found associated with pottery. The poor preservation of the skulls and of the postcranial skeletal parts led Koeze to conclusions that they were of but little value.

It took more than half a century before new studies appeared on Indian skeletal material; the lack of interest changed for the better when not only archaeology but also physical anthropology became a topic of special interest for the 'Foundation for Scientific Research in Surinam and the Netherlands Antilles' resulting in the studies of Van Heekeren and Du Ry (1960, 1963), of Wagenaar Hummelinck (1959) and of the present author (1959, 1960). Of specific importance in this respect was the foundation, in 1967, of the Institute for Archeology and Anthropology of the Netherlands Antilles in Willemstad, Curaçao.

The precolumbian skeletal remains from the Dutch Leeward Islands will be discussed below as far as the preservation allowed the gathering of at least some basic data. On the base of archaeological evidence a preceramic group and a ceramic group can be distinguished. This dichotomy will be followed below and the skeletal remains will be reviewed in the descending order of their age.

SKELETONS FROM THE PRECERAMIC PERIOD

Three sites yielded skeletal remains from this period:
- from Curaçao: the Michielsberg site
- from Aruba: Ceru Canashitu
  the Malmok site.

The Michielsberg site was reported on extensively by Haviser (a.o. 1985). Radiocarbon datings on shell-material yielded ages of 3790 ± 50 P.B. and 3820 ± 70 B.P.

Three skeletons were exposed completely. They were heavily fragmented and only an osteological study in situ was possible. The observations are presented below.

	Feat. 1	Feat. 3	Feat. 4
age at death	± 20	adult	adult
sex	male	male	female
stature	155	155	150

The dentition was strong; as far as could be observed from the side view, molar abrasion in Feature 3 and Feature 4 was only slightly in excess of that of Feature 1, so the age at death cannot have been far in excess of 30 years. Crowding of the teeth was noted in the premolar region of the mandible in Feature 3. All dentitions had erupted completely up to the third molar. Though the skulls had suffered heavily from transverse compression with resulting fragmentation, evidence for the great strength of the masticatory muscles could be discerned easily in each specimen. The fragmentary state of the skulls precluded the taking of measurements. The same applied to the long bones which bore clear testimony to their great robustness. The stature was based on the assessment of one long bone length in each skeleton.

Ceru Canashitu. In 1950, Ringma - an amateur archaeologist - investigated an abri on the north-eastern slope of Ceru Canashitu in Aruba. Remains of 5 human skeletons were found at a depth of less than 50 cm. The site is regarded as preceramic (Versteeg, this volume). A recent radiocarbon dating of bone-material yielded an age of 2210 ± 95 B.P. Fragments of two reasonably complete skulls and one skull-cap, all three from adult individuals, were recovered. In 1959 the present author published a study of the material. The main features are presented below; the designations C1, C2 and C5 are from Ringma's field report (Wagenaar Hummelinck, 1959).

	C1	C2	C5
age at death	30	30-40	30-40
sex	female	male	male
cranial index	81.3	76.3	79.0
height/length index	76.3	85.5	-
heigth/breadth index	93.8	112.1	-

The cranial indices cluster around the boundary between meso-and brachycrania (the breadth/length ratio of 80.0); C1 and C2 have cranial vaults which are clearly high with regard to the length and breadth. Absence of the cranial base in C5 made it impossible to obtain a height measurement but the vault of C5 was so closely alike to that of C2 that the height-classification can be assumed safely to be similar to that of C1 and C2.

Owing to the absence of long bones in the skeletal sample sent to the author, a determination of stature was impossible.

The Malmok site. In 1989 the author joined the archaeologist A.H. Versteeg in an excavation of the Indian burial-place in Malmok. The excavation itself yielded data on 31 adult individuals and 5 children. Remains from earlier excavations (Engels 1970, Boerstra 1973) were included in this study and made it possible to add some observations on another 5 adult individuals. Radiocarbon datings pointed to an age of about 1800 B.P. (see Versteeg, this volume).

On exposure, the skeletons proved to be soft and extremely friable; notwithstanding this poor preservation, it was possible to select determinants of sex, age and stature, which could be applied in all cases. Of the remains of children only the age was determined; their ages at death ranged from less than 1 year to about 10 years. The observations on adult skeletons are presented below.

The sex-ratio showed a perfect 1 : 1 distribution. The distribution of the ages at death (clustering based on molar wars as tabulated by Brothwell 1981, p. 72) over the sexes was as follows:

age at death	17-25	25-35	33-45	45 and over
n male	3	6	6	3
n female	4	2	8	4

There is a symmetrical distribution in the male individuals with the age-groups 25 - 35 and 33 - 45 in the centre. The distribution of the ages at death in the female individuals shows two peaks. The minor one in the younger age-group of 17 - 25 years is probably due to the hazards of the first pregnancy and delivery; the larger peak in the group of 33 - 45 years suggests a greater longevity in the females.

Male and female stature could be based in most cases on tibial length with the help of Genoves' (1967) tables. Their mean value shows a clear sexual dimorphism viz.:

Stature	male	female
n	15	15
$\bar{x}$	156.9	148.9
s	3.5	2.9

The dentition proved to be well-developed. Several cases of shovel-shaped incisors were noted and but few cases of caries were present. The very pronounced areas of attachment of the masticatory
muscles added ample testimony to the strength of the masticatory apparatus.

Eight skulls allowed the determination of the length (L) and the breadth (B); in five of these the basion-bregma height (H) could be determined. Their mean values, together with their ratios (indices) follow below:

	L	B	H	B/L	H/L	H/B
n	12	8	5	8	5	5
$\bar{x}$	187.0	136.4	146.4	72.8	77.1	108.1
s	6.9	5.5	3.9	3.9	2.1	6.1

The indices indicate that the skulls are dolichocran, 'high' with regard to the length as well as to the breadth. Although the sample was small the usual sexual dimorphism of the cranial index (B/L) could be noted:

B/L	male	female
n	5	3
$\bar{x}$	71.9	72.3
s	4.8	2.9

The frontal outlines were screened for signs of flattening as far as the condition of the skull left this area intact; flattening was definitely absent and this excludes artificial cranial deformation in the skulls studied.

As to pathology, next to the few recorded cases of dental caries and alveolar abscesses, very few cases of arthrosis were encountered in the large joints (hip, knee and shoulder). In the Malmok-population one case of Pott's kyphosis and one case of dwarfism were noted; both individuals, considered to be female, had reached an advanced age.

SKELETONS FROM THE CERAMIC PERIOD

Three sites yielded skeletons from the ceramic period:
- Curaçao: the Savaan site
- Bonaire: near Kralendijk
- Aruba: the Ceru Noka and Sabaneta sites.

The Savaan site. The archaeology of the site has been reviewed by Haviser (1987), the skeletons were studied by the present author (1987). Two, of the three skeletons, originate from a double burial excavated by Ayubi in 1980; both individuals were buried in a squatting position. They were designated as S1 and S2. The third skeleton, S3, originated from a primary 'inverted-urn' burial excavated by

Haviser by the end of 1984.

In 1985, S1 and S2 were radiocarbon dated at 1500 ± 200 B.P.; as the correctness of this dating was doubtful (Haviser 1987, p. 42) it was repeated when the opportunity arose in 1989. The final radiocarbon dating yielded an age of 1040 ± 100 B.P. A radiocarbon dating of S3 yielded and age of 660 ± 20 B.P

Though the preservation was poor, several measurements were obtained. For convenience sake they are repeated below (from author 1987).

	S-1	S-2	S-3
sex	male	male	male
age at death	20-25	30	30
stature	165	155	145
cranial index	90.5	78.8	?
height+/length index	65.5	62.4	?
height+/breadth index	72.7	79.2	71.8

± absence of the cranial base made it necessary to use the ear-(porion-) bregma height instead of the commonly used basion-bregma height.

The skulls are all 'low' with regard to the breadth and of medium height compared to the length. The cranial indices however show a divergence, S1 is ultrabrachycran whereas S2 is mesocran. S3 was clearly brachycran though this could not be substantiated owing to the absence of the posterior part of the skull, which made it impossible to obtain the cranial length.

Bonaire. The Bonaire skeleton was accidentally recovered during building activities near Kralendijk. Radiocarbon dating yielded an age of 760 ± 25 B.P. The preservation was exceptionally good, so a full set of skeletal data could be obtained (author 1980). To allow a comparison with the other skeletons, out of these data those characteristics were selected which could also be obtained from the others.

age at death	40
sex	male
stature	160
cranial index	86.6
height/length index	74.9
heigth/breadth index	86.5

This skull is clearly 'low' with regard to the breadth; with regard to the length, the height verges on the borderline between 'intermediate' and 'high'. The cranial index points to a strong brachycrania.

Ceru Noka Sabaneta. The datings associated with these sites are 1100 and 600 B.P. (Ayubi, Boerstra and Versteeg 1985). The author (1965) studied 8 skulls from this site obtained by Van Heekeren (1963). As the long bones were not

submitted for study, the stature could not be determined. In all specimens breadth and length of the crania could be measured; in only 4 the presence of the cranial base made it possible to obtain a basion-bregma height. Because of damage the age could not be ascertained, but all skulls were from adult individuals. The main data follow (from author 1965):

	L	B	H	B/L	H/L	H/B
n	8	8	4	8	4	4
$\bar{x}$	171.0	145.6	128.5	85.2	73.7	88.4
s	6.8	6.9	7.8	4.4	3.3	8.1

The means indicate that the skulls are strongly brachycran, 'low' with regard to the breadth and of intermediate height compared to the length. In the 4 skulls in which the ear-(porion-) bregma height had to be used, the pertinent classification of the H/B index was also 'low'; the mean of the H/L index fell into the classification of 'high' skulls.

Note : n, $\bar{x}$ and s in the discussed series stand for number of observations (n), arithmetic mean ($\bar{x}$) and standard deviation (s).

DISCUSSION

In both groups, the preceramic as well as the ceramic, the preservation of the skeletons left much to be desired. Notwithstanding this, it could be observed that the long bones of the preceramic skeletons (Michielsberg and Malmok) were very robust, far more so than those of the skeletons of the ceramic group. The available data also showed clear differences in cranial shape.

The skull from the preceramic period are mostly long (dolichocran), they are 'high' compared to the length as well as to the breadth. Artificial deformation of the head could be excluded. The masticatory apparatus is strongly developed as testified by the teeth and the skeletal sites of attachment of the masticatory muscles.

The skull from the ceramic period shows mostly a strong roundheadedness (brachycrania). They are of 'intermediate' height to 'high' with regard to the length and clearly 'low' as compared to the breadth. Artificial deformation of the plano-frontal type could not be excluded in some instances, but it was not outspoken. Only a few skulls allowed an inspection of the dentition. This, together with the attachment of the masticatory muscles, pointed to a masticatory apparatus which was less developed than that of the preceramic group.

In the following table, the subdivisions of the cranial index (B/L ratio), the height/length index and the height/breadth index are presented with the number of preceramic and ceramic skulls classified as such. Next to giving an easy review of the material, it has the added advantage that the height indices based on the basion-bregma height can be combined with those based on the porion-bregma height.

Cranial index (B/L)	dolicho-	meso-	brachy-	hyperbrachy-
preceramic	6	4	1	0
ceramic	0	2	4	7

Heigth/Lenght	low	intermediate	high
preceramic	0	0	8
ceramic	1	6	5

Heigth/Breadth	low	intermediate	high
preceramic	0	1	7
ceramic	11	1	0

Only those skulls have been included which allowed an actual measurement of length, breadth and height. This leaves out the Michielsberg skeletons and the greater part of the Malmok series. A visual impression however, as far as the preservation allowed this, places them easily in the range of the dolichocran skulls which are 'high' with regard to the length and the breadth.

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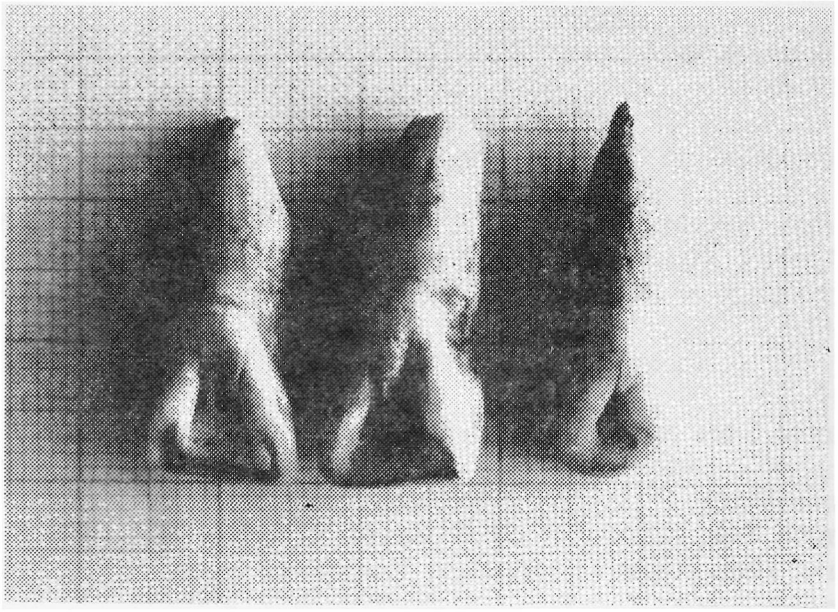

Fig. 1. Shovelshaped incisors, Malmok, Aruba (photograph by A. Versteeg).

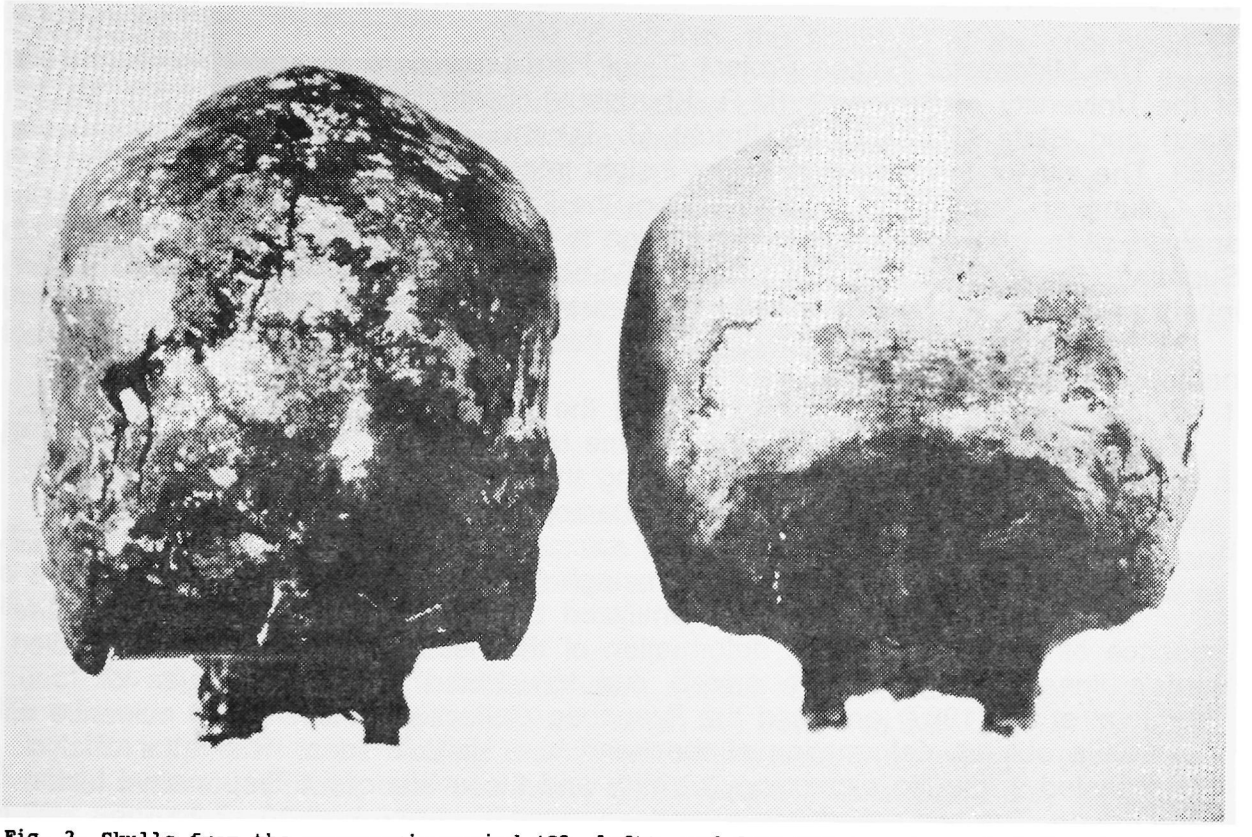

Fig. 2. Skulls from the preceramic period (C2, left), and from the ceramic period (Bonaire, right). Respectively, a 'high' and a 'low' skull. Orientation on the Frankfurter Horinzontal.