At the time of their discovery, the north-western coast of Venezuela, especially the peninsula of Paraguaná (east of the Gulf of Maracaibo), and the islands of Aruba, Curaçao and Bonaire, were inhabited by an Arawak-speaking tribe, the Caquetío. They were agriculturists and excellent navigators (Hernández de Alba, 1948). According to Hartog (1953) at least two pre-Columbian groups inhabited the Netherlands Antilles: one, which mainly left shell-heaps behind it, and another, later group which lived not only on sea products, but also from agriculture. It is not known whether this means that two separate groups were actually present together, as was the case in the Greater Antilles, where, at the same period, the fish-eating Ciboney (García Valdés, 1948) were succeeded by Arawak agriculturists. The remains may also indicate the cultural evolution of a cave-dwelling population of hunters, fishermen, and fruit and root-eaters into agriculturists, as Fewkes (1914) suggests.

Apart from records of rock paintings, the earliest mention of which occurs as far back as 1836 (Wagenaar Hummelinck, 1953), the first archaeological investigations were carried out by Father A. J. van Koolwijck in the second half of the nineteenth century. The specimens he collected are present in the National Ethnological Museum at Leiden; they were studied by Leemans (1904) and by de Josselin de Jong (1918). The human skeletal remains excavated by van Koolwijck were described by Koeze (1914). A new appraisal of the latter material may be found in the paper on 'Indian skeletal discoveries in Curaçao and Aruba' by Wagenaar Hummelinck (1959), in which the writer endeavours to give an historical survey of our scanty knowledge of Netherlands Antillean palaeo-anthropology.

To which ‘race’ did these Indian people belong? In order to obtain a basis for answering this question, a definition of the word ‘race’ must first be given. A human race may be defined as a subdivision of mankind distinguished from other subdivisions by a difference in the frequency with which certain physical features occur. The bodily features concerned are those which are determined by heredity, and are not, or at least not greatly, modifiable by environmental influences. For instance, head form is determined mainly by heredity, but weight is modifiable by nutrition to such an extent that it is useless as a means of identifying race. Stature, on the other hand, may also be modified by environ-
mental influences but not to such an extent as to render it a useless criterion.

It is obvious that a race diagnosis should be based on as many criteria as possible. The foregoing makes it clear that 'race' is a physical concept. It therefore follows that the name 'Caquetio', which merely points to an Arawak-speaking tribe, and the names 'Arawak' and 'Carib' which designate languages, are not a serviceable basis for a racial classification. In general, cultural – i.e. environmentally determined – characteristics are not racial criteria; a certain group of people may more or less develop its culture within a given time-span without changing its physical features. There are undoubtedly instances in which culture may lead to a behaviour pattern which produces an isolating mechanism (Shapiro, 1956). The genetic isolation produced in this way may after a given time, lead to the formation of new 'races'. In view of the cultural affinities between the territory under discussion and Venezuela, this possibility can be dismissed.

Geographical boundaries may also lead to isolation, if they form barriers which cannot easily be crossed. This has certainly not been the case here. It should be remarked that the word 'race' is usually only applied to large subdivisions. In the present article subdivisions of the entire group of American aborigines were made on the basis of the above-mentioned definition of race.

The bodily characteristics – i.e. the physical anthropology – of the Indian inhabitants of the Netherlands Antilles, whether as regards skeletal features of extinct groups or descriptions of the living, are unknown, apart from what is to be found in the abovementioned article by Koeze (1904), which, however, gives us no information of importance on the subject. In view of their close geographical proximity, and the cultural affinities already mentioned, it may be expected that the inhabitants of the north-western part of Venezuela, and those of the Netherlands islands off its coast, were closely related, even in pre-Columbian times. Fig. 15 shows the distribution of somatological groups in the northern part of South America, the Lesser and Greater Antilles and part of North America, according to Imbelloni (1938).

Imbelloni (1938) grouped together the Indians of the Greater and Lesser Antilles, Venezuela, the Guianas, and the Amazon drainage area under the heading 'Amazonid'. The physical features of this group, as described by him, and summarized by Newman (1949), are: short to medium-tall stature (in the north
Fig. 15. Distribution of somatological groups according to Imbolloni, 1938 (taken from Newman, 1940).
slightly less than 160 cm); robust build; head form 'medium-long' with 'brachycephalic tendencies' (cephalic index Caribs: 81–82.5; Arawak: 81–84); skin colour relatively light. The distribution, as shown in Fig. 15, proves that, to the west, this group reaches the region east of Lake Maracaibo, including the Paraguaná peninsula. According to IMBELLONI, in Venezuela this Amazonid group is adjoined by a more recent group, the Istmids. They are slightly smaller than the Amazonids, and the colour of their skins is darker. The head form is extremely round: cranial (or cephalic?) index is 86–89.5 (IMBELLONI, 1938). It may be remarked that in a later publication IMBELLONI (1952) mentions an even higher cephalic index as a characteristic of these Istmids, i.e. 'Indices um 100'. Their distribution as represented in Fig. 15, shows that the most eastward extension of this subdivision is the region west of Lake Maracaibo and the Gulf of Venezuela, including the Goajira peninsula.

If we look upon Aruba, Curaçao and Bonaire as a mere extension of Venezuela, which seems justified in view of geographical proximity and the cultural affinities, it may be expected that the population of Venezuela and those islands will be closely related, i.e. that the Indian population will present either Amazonid, or Istmid characteristics. It is perhaps justified to view skeletal remains from the area in the light of the schematic classification outlined above.

THE SKELETAL REMAINS FROM CANASHITO, ARUBA 1.

In view of the extreme scarcity of descriptions of skeletal material from the Netherlands Antilles, it seems worthwhile to devote special attention to some skeletal remains excavated by the late A. D. RINGMA on Aruba in 1950. This material comprised two skulls and one skull-cap, which appeared to be reasonably well-preserved when compared with RINGMA’s material from Hato, Curaçao, dealt with in HUMMELINCK’s above-mentioned paper.

Description of the site

The Aruba material, which comprised two more or less complete skulls and one skull-cap, was excavated in an ‘abri’ formed by a

1 The writer would like to express his gratitude to Dr. J. HUIZINGA, Head of the Department of Physical Anthropology of the Anatomical Laboratory at Utrecht, whose kind assistance helped to solve many problems involved in investigating the specimens, entrusted to him by Dr. P. WAGENAAR HUMMELINCK.
large boulder on the north-eastern side of the Seroe Canashito – a limestone-capped hill, which shows many signs of occupation in prehistoric times, such as large quantities of shells together with potsherds on its slopes, and rock drawings in its small caves (WAGENAAR HUMMELINCK, 1953). The collector's field notes regarding this site are to be found in HUMMELINCK’s 1959 paper.

Fig. 16. Cross-section through the abri near the Seroe Canashito, from a field sketch by A. D. Ringma.

The big piece of limestone forming the abri, inclines slightly to the north-east, and gives but little protection. As RINGMA remarks, the sandy level in front is well suited to agricultural purposes. The floor is described as consisting of loose, dirty sand, on which numerous scattered shells and potsherds were found. No rock drawings were observed on the walls of the abri.

Five skeletons were unearthed at depths varying from 5 to 30 cm. The positions in which they had been interred have been sketched in detail by RINGMA (see Fig. 17). In his report he draws attention to the rather unusual position of C-5, which might have been due to a rock that proved to be present below the abri’s floor.

It may be noted that the mode of disposal of the dead in this case had been by way of ‘primary’ burial in which the body was interred in a flexed position. A burial is called ‘primary’ if the body is not allowed to disarticulate prior to interment, as opposed to a ‘secondary burial’, which is defined as ‘a method of disposal of the dead subsequent to total or partial disarticulation of the
Fig. 17. Position of the skeletons at the abri near the Spece Casahito, Aruba, according to field sketches by A. D. Ringuia.
skeleton’ (Kidder, 1944, p. 51 and p. 42). Primary burial may be carried out either by direct interment of the body – as was evidently the case with the Aruba skeletons – or by disposal of the dead in urns. De Josselin de Jong (1918) states that such primary urn burial may have been practised in Aruba; in support of this he mentions an eyewitness report from Van Koolwijk’s letters.

The conservation of the material was bad, and Ringma only succeeded in excavating two skulls, C-1 and C-2, in such a way that they could still be used for anthropological investigation after reconstruction. The reconstruction was performed by Ringma himself, with great care and very satisfactorily. In the material received for investigation C-5 is represented only by a skull-cap.

Description of the skulls

The specimens mentioned in Ringma’s field notes as Canashito I No. 1, 2, and 5 will be designated in the following description as skulls C-1, C-2, and C-5.

Skull C-1 (Figs. 18, 22-24)

The state of preservation of this small skull is bad; it lacks the right half of the calvarium, the left half of the skull base, the left orbital rim and malar bone. In some places the brown paint applied after excavation is peeling off, showing the white porous bone underneath. Compared with C-2 and C-5, the frontal contour of C-1 is more rounded and the muscular markings are less conspicuous. It therefore seemed justified to regard specimen C-1 as having belonged to a female individual. The age, as indicated by cranial suture closure, was estimated at about 30 years. The measurements pertaining to the skull as a whole are:

- Length (greatest) 158 mm
- Breadth (greatest) 130 mm
- Height (basion-bregma) 122 mm

The indices computed from these measurements are:

- Cranial index 82.3
- Height/length index 77.2
- Height/width index 93.8
- ‘Mean height’ index 84.7

This rather small, brachycranial skull is therefore ‘high’ with regard to the length and medium high with regard to the width. If the judgement ‘high’ or ‘low’ is based on the ‘mean height’ index, the skull is high. In its vertical aspect, the skull is ellipsoid. The sutural pattern is simple. The occipital view (Fig. 24) shows a triangular space at the junction of the sagittal and lambdoid sutures in which an apical bone has been present. Wormian bones are absent from the latter suture.

The vaulting of the skull is even, as can be seen in Fig. 23 and in the median outline tracing in Fig. 18. It does not suggest any pre-mortal...
artificial deformation. The occipital curve is well-rounded, with almost no indication of an initial flexure; the mastoid process (Fig. 23) is not excessively developed.

The zygomatic bone takes a backward turn, forming two more or less distinct planes, an anterior and a lateral one – a typical mongoloid feature; as OETTEKING (1925) pointed out, the horizontal outline in negroid and europid skulls is more evenly rounded and distinctly flatter.

As can be inferred from the total facial index of 82.8 and the upper facial index of 47.5, the facial part of the skull is rather low and broad. The frontal bone shows rather even vaulting; the tubera frontalia, glabella, crista temporalis and metopic crest are but slightly indicated. The zygomatic process of the frontal bone shelves smoothly downward and slightly backward, thus strengthening the impression of roundness of the orbit. The orbital index of 97.14 indicates that it is not only round but also high. A fossa canina is absent; consequently, the plane below the orbits is flat, and not concave as in europid or negroid skulls. The nasal index of 51.1 indicates a broad to medium-broad nasal aperture.

The dental arch is paraboloid in shape; the palate is rather broad, as is indicated by the palatal index of 86.5. Dental wear is excessive in view of the assumed age of the subject; it amounts to Martin’s Grade 2. The third molar is impacted; the left 12 approaches the condition ‘semi shovel-shaped’ in Dahlberg’s classification. The teeth are large, as indicated by a dental index (Flower) of 45.1.

Skull C-2 (Figs. 19, 25–27)

The state of preservation of this specimen is comparable with that of C-1. Missing are the left orbit, the left lower half of the frontal bone, the temporal bone, the sphenoid, the basal part of the occipital bone.

The age of this apparently male skull was estimated at about 30–40 years – again on the basis of cranial suture closure.
The measurements pertaining to the skull as a whole are:
Length (greatest) 173 mm
Breadth (greatest) 132 mm
Height (basion-bregma) 148 mm
and the indices computed from these measurements are:
Cranial index 76.3
Height length index 85.6
Height/width index 112.1
'Mean height' index 96.7

These figures confirm the impression gained from mere observation, viz. that this skull is very high. The cranial index shows that the specimen is medium-broad; skull C-2 is indeed longer than C-1, their greatest breadth being almost identical. The difference might be at least partly due to the fact that a female skull is usually more round than a male one.

As has been pointed out already, the frontal region in this specimen is slightly flatter than in C-1. The outline in the sagittal plane is quite regular, as can be seen in Fig. 26, and in Fig. 19, in which the median outline tracing of the skull is shown.

Fig. 19. Skull C-2, median outline tracing.

As can be judged from Fig. 27, which shows the occipital aspect of the skull, the specimen is house-shaped (lophocephalic), i.e. the lateral walls go rather straight upward and the parietal bones present an outline resembling a roof. Also noteworthy in this specimen is the presence of an apical bone in the junction of the lambdoid and sagittal sutures. This bone – or, at any rate, the space in which it had been present – was also noted in skull C-1 (Fig. 24).

The mastoid process and other marks of muscular insertion are stronger than in specimen C-1. The malar bone forms a backward turn slightly rounder than that of the malar bone in C-1.

The upper facial index of 47.9 and the total facial index of 77.1 show that the face is rather low and broad. The frontal bone slopes smoothly backward. On the medial part of the supra-orbital rim, a well-developed superciliary arch is present.
The orbit is of the same 'high' category as in skull C-J; the nose is medium-broad. The relevant orbital and nasal indices are 90.0 and 48.1, respectively.

A fossa canina is absent.

The palatal index of 90.4 shows that the palate is rather broad. Dental wear is excessive, as can be judged from the remaining teeth; it amounts to Martin's Grade 3. The dental index of 42.3 shows that the teeth are slightly smaller than those of skull C-J.

**Skull C-5 (Figs. 20, 28-29)**

This skull is represented by a skull-cap only; large parts of the left and right sides are lacking (Fig. 28). The muscle markings are quite similar to those represented in skull C-2, hence the sex of the individual to which this skull belonged was assumed to be the same as that of C-2, i.e. male. The age was assumed to be about 30-40 years.

The measurements of the vault are:

- Length (greatest) 167 mm
- Width (greatest) 132 mm (? ?)

so the cranial index is 79.0

The height of this medium-broad specimen could not be determined with any reasonable degree of certainty, but the vault certainly belongs to a high skull. In general appearance, it looks quite similar to the vault of C-2. This close resemblance between the two skulls in the median plane is demonstrated in Fig. 20, which gives a superposition of the median-sagittal outline tracings of both skulls; the two lines follow each other fairly closely, the only difference being the smaller size of C-5. As the latter consisted of the vault only, both tracings were oriented upon the glabella-opisthocranion line (i.e. the line of greatest length) and not upon the Frankfurt horizontal generally used.

In its occipital part (Fig. 29), skull C-5 also indicates the presence of an apical bone in the place where the sagittal and lambdoid sutures meet.
Comparison of the descriptions of the skulls shows that they have much in common. The resemblances of C–5 (vault only) with the vault of C–2 have already been pointed out. If we compare the features of skulls C–1 and C–2 we see that the cranial indices (82.3 and 76.3, respectively) differ by several index units. This difference may be at least partly due to the fact that skull C–1 is that of a female individual. The cranial index of C–5 is 79.0, and has accordingly an intermediate value. A comparison of the metric data of the face reveals that both skulls, C–1 and C–2, have a low face (the upper facial indices, 47.5 and 47.9, are nearly identical; the total facial indices, 82.8 and 77.1, differ by several units; but both nevertheless point to a short, broad face). The orbits are high in both skulls, the orbital indices being 97.1 and 90.0. The respective nasal indices, 51.1 and 48.1, differ but little; the nose may be classified as broad to medium broad. The palate is wide. In all three skulls an apical bone is present in the junction of the sagittal and lambdoid sutures.

Skulls excavated in the Antilles may belong either to imported negroid or to Indian inhabitants. The many mongolid features, such as the head form, which is broad to medium; the simplicity of the sutural pattern; the high, round orbits; and, especially, the form of the malar bone, which, together with the absence of the fossa canina, present a rather typical mongolid cheek, make it impossible to regard these skulls as negroid, and it seems fully justified to consider them as Amerindian.

In studying Amerindian skulls, it is necessary to bear in mind the possibility that they may have been artificially deformed. The presence or absence of such deformation must be determined, as the characteristics of the vault, such as length, breadth, height and general form, play a major role in a comparison of series of skulls. The value of these features for comparative purposes is based upon the fact that they reflect to some extent the genetically determined shape of the brain-case; and it is clear that this value is greatly diminished if the head has been re-shaped to such a degree that original features have been severely distorted or even lost. With this in mind, an answer has to be found to the following questions:

1. Was cranial deformation practised by the Indians who
inhabited the region under discussion? In other words, may we expect the skulls described to be deformed?

2. If so, what mode of deformation was practised?

When these two questions have been settled the Aruba skulls should be studied from this point of view. If they prove to have been deformed, a third question has to be answered, i.e.:

3. Are they deformed to such an extent that the features presented are unreliable representatives of the genetically determined head form of the population? (useful for racial comparison).

Re 1. According to Stewart (1950) deformation was indeed practised in these areas. From Stewart's statement that the custom was on the wane at the time of the advent of the whites, it may be concluded that the skulls described from Aruba are not necessarily deformed; however, the odds that they are deformed, cannot be ruled out.

Re 2. The mode of deformation prevalent in the region under discussion can be classified as parallelo-fronto-occipital; the head was deformed in infancy by pressure exerted in opposite directions on the frontal and occipital parts of the skull by means of two parallel planes. The result of this intentional shaping of the
head in infancy is shown in its extreme form in Fig. 21 (modified after IMBELLONI, 1930). It is easily understood that such a mode of deformation will cause an inhibition of growth in the direction in which pressure is exerted. This will result in:

a) a compensatory increase in the breadth of the skull (with a possible increase of the cranial index), and in its height.

b) pivoting of the plane of greatest length around the anterior point (glabella), with a resulting upwards displacement of the posterior point (opisthocranion).

c) locally, flattening may be expected in the region at which pressure is exerted. According to STEWART (1950), marked flattening occurs mainly in the frontal region, which may even become concave. The occipital region is usually less affected.

Now, as regards the present Aruba series, the problem of artificial deformation is not a major one in the case of skull C-1. The vaulting is regular, the brachycranialism – which, as such, is certainly not excessive – may at least partly reflect the female sex of the individual. The height is not excessive, either; and the position of the plane of greatest length is not far from the normal. A frontal flattening is also not obvious.

Study of skulls C-2 and C-5 leaves us with some doubt; they are indeed quite high, and this feature could certainly be the consequence of a parallelo-fronto-occipital deformation, as can be seen in Fig. 21. Now let us look for other sequelae of this kind of deformation, i.e. displacement of the opisthocranion, a possible increase of the cranial index, and frontal flattening. As can be seen in the median outline tracings of skull C-2 (Fig. 19), the opisthocranion lies at a higher level than normal. The vaults of skull C-5 and C-2 have much in common, so the odds are great that this also applies to skull C-5. As regards the cranial index of the skulls, it is hard to judge to what extent the mesocranialism of both skulls is due to deformation. The value of the cranial index in the female skull C-1, amounting to 82.3, points to the possibility that mesocranialism in males would be quite normal. The frontal flattening – if present at all – is certainly not excessive, which indicates that, if artificial deformation is present, it is only of minor extent.

In view of the above it seems justified to describe the vaults of all the skulls under discussion as meso- to brachycranial, and high. It seems wise, however, to keep in mind the possibility of skulls C-2 and C-5 having been artificially deformed.
Generally, the object of comparing series of skulls is to establish their degree of similarity as an expression of racial affinity. The choice of series with which given specimens have to be compared is based upon an expectation of racial affinity. The series with which the Aruba skulls are to be compared in expectation of similarity must be cranial series from Venezuela; expectation of racial affinity is based upon the geographical proximity and the cultural affinities which have already been intimated. The latter factor may indicate that contact existed between two groups at some time.

In evaluating the results of comparing groups with the aim of establishing racial affinities, it is necessary to take into account changes which may occur in course of time in a given group of people residing in a certain territory. This is obvious, for two reasons:

1. An isolated group of people may exhibit changes in head form in the sense that the head becomes rounder. This phenomenon of progressive brachycephalization (Weidenreich, 1945) may be followed in course of time by a process of debrachycephalization; the occurrence of this process has been discussed in the case of Dutch Frisian skulls by Huizinga (1958). Another change recognized as happening in time is a diminution in the size of teeth (Hooijer, 1950), which may reflect a reduction of the masticatory apparatus, with resultant changes in some proportions of the skull.

2. The above-mentioned features of an 'evolution in situ' may occur in any isolated group in time. Another possible reason for change is that migrations may have disturbed the original composition of the people inhabiting the territory from which the cranial series were selected for comparative purposes. This possibility has clearly to be kept in mind in discussing cranial series from Venezuela, as that country lies near the main migration route from North to South America.

Caution is required in evaluating the results of a comparison of the Aruba skulls – which are 'floating in time' – with Venezuelan series. The Aruba skulls certainly do not belong to the extremely round-headed, Isthmian subdivision, so we have to compare them with Venezuelan series assigned to the Amazonid group. These Venezuelan Amazonid series are those used by Stewart (1943); they are the same as are listed in the Handbook of South American Indians, Vol. VI (Stewart & Newman, 1950). They amount to a
total of 208 skulls, originate from several parts of Venezuela, and are described by Marcano (1890, 1891, 1893) and Virchow (1886). On the average, the crania are low-headed and medium-round, and, accordingly, they do not resemble the high-headed Aruba series. With regard to the dating of the Venezuelan groups it may be remarked that the Piaroa skulls included in the whole series are recent, whereas the Cuica and Timote skulls (Marcano, 1891) are called 'pre-Columbian'. It may be of interest to note that the skulls of the latter (pre-Columbian) group are, on the average, the highest of the whole series. Stewart (1943), who mapped the distribution of the cranial height (expressed in the 'mean height index') of South American cranial series, obtained the impressive result given in Stewart (1943), Stewart & Newman (1950) and Newman (1949). The salient point in this distribution is that the low-headed group is situated in one relatively compact area in the north-western part of South America (i.e. the part easily accessible from North America), whereas the high-headed skulls were found in the more marginal areas. From this distribution, and from the fact that most skulls for which considerable antiquity has been claimed are high-headed, the impression was gathered that the people represented by low-headed crania form a recent intrusion into South America, and that the marginal high-headed groups are older.

With this in mind, one would be inclined to see in the Aruba specimens discussed here
a) either the remains of a group which inhabited Venezuela before the intrusion of the more recent low-headed groups, or
b) the descendants of the group mentioned under a).

To support this speculation:
1. establishment of an adequate dating for the skeletal discoveries, or, if this is not possible, of a cultural sequence in association with them is necessary. If this sequence – which should also be established in Venezuela – points to the fact that older strata really do contain more high-headed skulls than low-headed ones, the theory will be more feasible.
2. collecting more skeletal remains from Aruba with undeformed skulls would be a great help.