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CRANIOLOGICAL MATERIAL FROM NEW GUINEA, INDONESIA AND THE MALAYAN PENINSULA

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I. CRANIOLOGICAL TYPE OF PAPUANS

HISTORY OF THE STUDY

The first publication which dealt at least to a certain extent with a large collection of Papuan skulls was a paper by A. Mayer (A. Mayer, 1886). He had at his disposition more than a hundred skulls coming from the inland areas of the island. He excluded all questionable cases where sex could not be determined and therefore his averages are based on a number of observations smaller than the total number of skulls. Individual measurements were carried out on all skulls, even on these where sex could not be determined with sufficient certainty. A paper by P. Mantegazza (P. Mantegazza 1877, 1881) took up, chronologically, this work. To begin with, Mantegazza published measurements of more than a hundred skulls, also from the interior, and then added a series of about another 30 skulls. At about the same time there was published the paper of O. Thomas, who described skulls from the western areas around the Torres strait (O. Thomas 1884). For the calculation of averages Thomas used only those skulls whose sex was beyond dispute. At the turn of the century an article was published by the well known writer of the craniology of the Oceanian population—W. Turner (W. Turner, 1899). The craniological material on Papuans which Turner had at his disposition was not nearly so extensive as that which concerns the craniology of Polynesians and Tasmanians—altogether 10 skulls, which came, however, from a new region (the delta of the River Purari). Two years later J. Gray published incomparably richer material from this region (J. Gray 1901). His measurements, however, contained, unfortunately, only a few values, and have not therefore great significance at the present time. A similar situation exists with the material of A. Haddon (A. Haddon 1915—1916), who published only single cranial measurements.

A. Van den Broek described a large colection of Papuan skulls from the south-west region of New Guinea (A. Van den Broek, 1923). The craniology of Papuans in the area around Humboldt Bay and the southern region of New Guinea formed the subject of research by P. Wirtz (P. Wirtz 1926).

The material of E. von Bondy-Horowitz, on the other hand, comes from almost all the north-eastern parts, but only some of his groups are large enough (G. von Bondy-Horowitz, 1930). The three last works contain a large number of measurements and can, therefore, be of great use today. The same is true of L. Graf's work, but the material used is not extensive and is very local, because it comes from only a limited region in the west of New Guinea (L. Graf, 1931). The material studied by F. Wood Jones and A. Cave (*F.* Wood Jones 1936, A. Cave 1936) is practically of no interest, because their work contains only single measurements. The publication of H. Bos does not suffer from this shortcoming, but as most of the mean values are not calculated to an accuracy of one tenth, their use is problematic. (H. Bos 1955).

A great part is played in the history of the study of Papuan craniology and in the study of the craniology of Oceanic nations generally by the thorough book of K. Wagner (K. Wagner 1937).

Wagner himself did not measured Papuan skulls, but carried out, with the precision which marks the representatives of the English biometrical school, the revision of all earlier works, in the course of which he uncovered mistakes in the calculation of mean values and in adition calculated mean values for many measurements which were absent in the original publications. His conclusions on the mutual generical relationship of racial characters in the Australian and Oceanian area are based on the use of the co-efficient of racial likeness invented by K. Pearson, which, as is known, has often been sharply criticised. This limits therefore the significance of his information. Wagner's summary of the information and its detailed evaluation ensured the special significance of his book right up to the present day.

After the basic work of K. Wagner there appeared two publications specially devoted to the carniology

of Papuans. The first of them is W. Hambly's, in which he described Papuan craniological material, which is kept in the Field Natural History Museum in Chicago (W. Hambly 1940). The author had at his disposition about 200 skulls from the north and south coasts of New Guinea. The programme of the study is exceptionally detailed, which favourably distinguishes W. Hambly's book from earlier publications. The other work which appeared after the book of K. Wagner is an article by P. F. Taratorkina, in which is described part of the collections kept in the Museum of Anthropology and Enthnography of the Academy of Sciences of the USSR in Leningrad. The description is supplemented with secondary detail, which can not be used for a lack of incidental information concerning other series, in addition to which many indications which are really important to the work are not mentioned.

In this review I do not deal with any description of individual skulls without known localisation. We can find their incomplete ennumeration in an article of P. F. Taratorkina (P. F. Taratorkina 1949). It is, however, apparent even without this that all the important publications mentioned already contain the necessary information on the basic variations of the craniological type of the Papuans over their whole area of settlement.

THE ORIGIN OF THE MATERIAL

The material was studied in three museums—in the Museum of Anthropology and Ethnography of the Academy of Sciences of the USSR, in the Museum of Normal Anatomy, Army Medical Academy, and in what was the Natural History Institute of P. F. Lesgraft, whose anthropological collections have already been handed over to the Museum of Anthropology and Ethnography. The basic collection is registered in the Museum of Anthropology and Ethnography under the number 212. It consists of 27 skulls. Of these 14 are male, 13 female. In the same series, acording to P. F. Taratorkina, male skulls were eminently predominant: of 24 skulls which she studied, she determined 16 to be male and only 8 to be female. P. F. Taratorkina and I determined sex craniologically, because there were no postcranial bones in the collection.

I concentrated on anatomical characters, on the usual interseexual differences, and used my own previous experience; the mean values found for male and female skulls do not differ, on the whole, from those usual in contemporary series. It is also necessary to add that the sex of the other Papuan skulls which I had at my disposition was also determined craniologically. In the Museum of Anthropology and Ethnography are collections 5132 and 5499, and also some skulls which are not yet registered, which were transferred from the Natural History Institute od P. F. Lesgraft to the Museum of Anthropology and Ethnography under the number 16—51, 104—105, 777 (*Tab. 28*).

The origins of all this material are various. Collection 212 comes entirely from the collections of N. N. Miklucho-Maklay and was handed over to the museum in the year 1891. Out of 27 skulls in this collection, 19 come from New Guinea, the remainder from neighbouring islands. From N. N. Miklucho-Maklay's notes, it is apparent that the skulls of Papuans which he found belong to the populations of various regions of New Guinea, although he spent most of his time on the shore of Astrolabe Bay. They were published together with a translation of the articles and letters of N. N. Miklucho-Maklay: „Sobranie Sočinenij v Pjati Tomach". (Moskva—Leningrad 1950—1954.) It is not therefore possible to determine their localisation exactly within New Guinea. Collection 5132 came to the Museum of Anthropology and Ethnography from the Army and Navy Museum in 1932, collection 5499 from Army Headquarters in the Dutch East Indies, in 1841. These are Papuan skulls from New Guinea without more exact documentation. The skulls kept in the collection of the Army and Navy Academy were handed over by the officers of the corvette "Vítěz" in the years 1874—1875. They were found in regions near to Astrolabe Bay. Skull 777 forms the only exception; documentation on the place in New Guinea where they were found has not survived, as with skulls kept in the Museum of Anthropology and Ethnography. Our material is not very suitable from the point of view of territorial classification, both because it is scanty and because it is not fully documentated. It will, therefore, be used in the following pages mostly for general comparisons.

GENERAL CRANIOLOGICAL CHARACTERISTICS

Measurements and shape of the brain case.

Papuan skulls are not large, the length of the brain case is average, the breadth and height are small (*tab. 1.*). The frontal bone is narrow and heavily slanting. Bone relief is medium developed, which can be seen not only from the mean values of the supraorbital area and the mastoids, but also from the relatively slight relief in the areas of the nuchal muscles. The skull index is on the border between dolicho— and mesocrany, the series as a whole showing marked hypsistenocephaly, a general characteristic of populations from the equatorial zone (Miklucho-Maklay 1950—1951). This fact is specially remarked on by V. P. Volkov-Dubrovin and Ja. Ja. Roginskij (1960). The relative width of the forehead, without regard to the small absolute value, is considerable, which is connected with the extremely small value of the transversal breadth of the skull.

Measurements and shape of the facial skeleton.

The measurements of face are not large, as is usual with representatives of tropical racial groups. The facial skeleton is high. The small width of the skull calls to mind the exceptionally large relative breadth of the face—the horizontal faciocerabral index is higher than 100 : 0. The vertical faciocerebral index is also an indication of the relative height of the facial skeleton, as is the upper facial index. The orbits have

TABLE 1

Average Measurements and Indices of investigated Papuan Skulls (Indication and Measurement according to Martin)

Indication	Measurement	♂		♀	
		n	$\bar{x}$	n	$\bar{x}$
1	cranial length	20	177.6	26	168.9
8	max. cranial breadth	20	133.2	25	129.1
17	basion-bregma height	18	130.7	25	126.9
20	auricular height	20	111.1	26	108.2
5	basicranial length	18	98.6	25	95.0
9	minimal frontal breadth	20	92.7	26	90.6
12	occipital breadth	19	106.4	25	102.0
	supraorbital arches (1—6 Martin)	20	2.75	26	1.81
	processus mastoideus (1—3)	20	1.75	25	1.12
8 : 1	cranial index	20	75.2	25	76.5
17 : 1	height-length index	18	73.7	25	75.2
9 : 8	frontal-transversal index	20	69.6	25	70.2
9 : 12	fronto-occipital index	19	87.2	25	89.0
40	length of the facial base	17	102.7	25	98.4
45	bizygomatic breadth	18	131.2	24	121.1
48	upper facial height	18	69.6	26	64.5
51	orbital breadth from mf (left)	18	42.2	26	40.0
51a	orbital breadth from d (left)	18	39.6	26	37.5
52	orbital height (left)	19	32.4	26	31.7
54	nasal breadth	18	24.9	26	24.3
55	nasal height	18	52.9	26	48.8
DC	dacryal breadth	17	21.0	25	19.6
DS	dacryal height	17	11.3	25	9.7
SC	symotic breadth	17	9.4	25	9.2
SS	symotic height	17	4.2	25	3.6
32	frontal angle (ma-me)	19	83.6	26	88.4
	frontal angle (gl-me)	19	76.3	26	82.6
72	total facial angle	17	81.6	26	81.7
73	middle facial angle	17	82.5	25	83.5
74	alveolar angle	16	77.4	25	74.6
75/I	angle of nasal bones to facial profile	16	20.8	25	17.4
77	nasomalar angle (fm-n-fm)	20	138.5	26	141.0
	zygomaxillar angle (zm-ss-zm)	17	119.9	26	120.7
	depth of fossa canina (left, in mm.)	16	4.6	25	4.4
40 : 5	index of facial prognatism	17	103.8	25	103.7
45 : 8	horizontal faciocerebral index	18	98.6	23	94.7
48 : 17	vertical faciocerebral index	17	53.2	25	50.7
48 : 45	upper facial index	18	53.1	24	53.2
52 : 51	orbital index from mf (left)	18	76.6	26	79.0
52 : 51a	orbital index from d (left)	18	81.5	26	84.7
54 : 55	nasal index	18	47.3	26	50.0
DS : DC	dacryal index	17	54.0	25	50.0
SS : DC	symotic index	17	46.8	25	39.2
	index of the curve of the facial bones (U Din-Lian)	17	22.6	23	21.8

average measurements, a circular shape is heavily predominant.

Construction of the facial skeleton.

The height of the nose is medium, as is the bredth of the pyriform aperture. Their relation gives rise to a mesorrhine index. This index value is basically an exception in Papuan skulls, even if we discovered, to a small extent, in some groups, values which were not very different. In my opinion we can clarify this circumstance by the method of measurement. The method of measuring the height of the nose which is adopted by many Moscow anthropologists (G. P. Debec, M. G. Levin), includes subnasal groves, if they occur. The upper height of the face, is being measured from the lower edge of the fossae praenasales. This method of measurement is justified as follows, that in many cases the edge of the nose, where there are fossae praenasales (according to Martin it is important to measure the upper height of the face exactly from the lower edge of the nose) is indistinctly demarcated, and still worse demarcated is if incisura praenasalis exist. This newly introduced concept is unfortunately not separately described in the brief description of methods of craniological measurement given by G. F. Debec and the author (V. P. Alexejev, G. P. Debec 1964). The great majority of experts (and formerly even more of them) measure the height of the nose according to the direct instructions of Martin. The height of the nose, is, therefore, in my measurements, greater, on account of the fact that the percentage of occurrence of praenasal fossa and praenasal incisure is very high in Papuan skulls. In consequence of this, the nasal index is, understandably, lower.

Prominence of the nasal bones is small. Papuan skulls show similarity to mongoloid skulls in this

TABLE 2

Territorial Variation of the Craniological Type of the Papuans (♂♂)

Indication	Measurement	Biak Island	Humboldt Bay	Geelwink Bay	Central regions of New Guinea (south)	Northern New Guinea	Onin Peninsula	Lawrence River	Torres Strait
1	cranial length	187.0 (58)	184.5 (51)	187.5 (104)	178.8 (137)	176.6 (140)	183.7 (18)	179.5 (47)	190.6 (14)
8	max. cranial breadth	133.0 (58)	131.7 (51)	133.6 (104)	130.7 (136)	131.4 (142)	126.7 (17)	127.1 (47)	130.0 (14)
17	basion-bregma height	135.0 (57)	134.5 (51)	138.4 (103)	130.2 (109)	130.9 (119)	132.3 (16)	130.9 (43)	135.4 (14)
8:1	cranial index	71.2 (58)	71.5 (51)	71.2 (104)	73.2 (136)	74.4 (140)	69.0 (17)	71.0 (47)	68.3 (14)
17:1	height-length index	72.4 (57)	73.0 (51)	73.8 (103)	72.8 (109)	74.6 (119)	72.0 (16)	73.3 (43)	71.1 (14)
9:8	transversal frontal index	72.2 (58)	72.4 (51)	72.0 (50)	71.1 (133)	71.2 (141)	74.3 (17)	72.7 (47)	—
40	length of the facial base	104.0 (46)	103.0 (48)	—	102.8 (76)	102.1 (112)	102.7 (17)	101.4 (41)	110.2 (18)
45	bizygomatic breadth	132.0 (54)	131.9 (50)	131.6 (90)	127.7 (114)	128.8 (121)	127.5 (14)	124.5 (37)	135.2 (17)
48	upper facial height	69.2 (49)	67.3 (48)	—	65.7 (106)	66.5 (131)	65.7 (17)	65.2 (45)	71.5 (18)
51	orbital breadth from mf (left)	43.0 (58)	42.4 (51)	—	41.2 (103)	41.1 (139)	41.8 (18)	41.3 (47)	—
51a	orbital breadth form d (left)	—	—	40.0 (50)	39.2 (42)	39.4 (59)	—	—	—
52	orbital height (left)	34.5 (58)	34.1 (51)	34.3 (97)	33.4 (132)	33.6 (140)	33.6 (18)	33.7 (47)	32.0 (18)
54	nasal breadth	27.4 (57)	26.2 (49)	27.0 (50)	25.8 (129)	25.4 (138)	25.9 (17)	25.4 (47)	25.7 (18)
55	nasal height	51.2 (57)	51.0 (48)	51.0 (50)	50.3 (131)	49.5 (136)	51.0 (18)	49.1 (47)	48.2 (18)
72	total facial angle	78.7 (48)	80.8 (47)	—	78.0 (99)	81.2 (119)	77.0 (16)	77.0 (45)	—
45:8	horizontal faciocerebral index	99.4 (54)	100.2 (50)	98.7 (90)	98.4 (114)	97.6 (117)	100.1 (15)	97.6 (37)	104.0 (14)
48:17	vertical faciocerebral index	52.4*	51.0*	—	51.4*	51.6*	51.1*	52.4*	52.9*
48:45	upper facial index	52.3 (46)	51.5 (48)	—	51.9 (89)	51.6 (120)	51.4 (14)	52.2 (36)	52.9 (17)
52:51	orbital index from mf (left)	80.2 (58)	80.3 (51)	—	82.1 (103)	81.8 (139)	80.3 (18)	81.6 (47)	—
52:51a	orbital index from d (left)	—	—	85.0 (50)	84.5 (42)	84.6 (59)	—	—	—
54:55	nasal index	53.6 (56)	51.6 (48)	52.9 (50)	51.4 (129)	51.2 (136)	51.4 (17)	52.0 (47)	53.4 (18)

*) *Index of mean values*

respect. Among mongoloid and especially among African negroid types, it is true, there are groups with still smaller nasal prominence (e. g. Bushmen), (H. Pacher 1961), but the difference is not great. The height of the root of the nose is also small with Papuan skulls. The craniological information does not, therefore, confirm the idea widespread in specialized literature, based on a visual impression of a strong nasal prominence in Papuans. Their noses are apparantly more prominent than in African negroids, but the degree of difference is smaller than is usually presumed on the basis of somatological material and photographs, and it is in no way possible to speak of some relation to europeoids on the basis of this character.

Vertical profile of the facial skeleton.

The index of facial prominence is high. According to it only some negroid series have higher value than papuan ones. The face protrudes substantially forwards both with regard to the slant of the upper part ot the face, as well as a consequence of clearly evident alveolar prognatism. It is strengthened also by the fact that the incisors protrude forwards. It is interesting to note that we do not find in this series differentiation between the characteristics of the vertical profile, obtained with the help of angles audindices. This is the case central Asian mongoloids: the mesognath index corresponds there to high values of the angles which characterize the profile as orthognath (G. F. Debec, 1951). This discrepancy is a consequence of the position of the basion, declining backwards.

The horizontal profile of the facial skeleton

There is a widespread idea in the literature of a great flattening of the upper part of the facial skeleton in negroids, which corresponds to a similar flattening in mongoloid skulls. Apart from the early work of U Din-Lian and G. Morant, devoted especially to the study of a gradual flattening of the facial skeleton in representatives of various races, there exist no direct craniological observations. (T. Woo, G. Morant 1934.) Flattening of the facial skeleton in the nasion and in the frontomalar orbital region was expressed using an index whose denominator was the chord joining these points and the numerator the height of the nasion above it. The measurements of the nasomalar angle on Papuan skulls do not confirm the impression of a flattening of the upper part of the facial skeleton found in all series of equatorial skulls without exception. The found value corresponds to the values characteristic for europeoid series.

The zygomaxillar angle is characterized by very low values, substantially lower than similar values for europeoid skulls. The size of this angle apparently strongly influences the degree of prognathism, especially the alveolar prognathism—so that in prognathic skulls this value automatically increases. It is necessary to bear in mind that the prognathic Nigerian series are not very different from the Papuan in this respect. The representatives of the three great races usually distinguished can therefore be differentiated according to these characters. The minimal values are typical for equatorial populations, the ma-

Territorial Variation of the Craniological Type of the Papuans (♀♀) TABLE 3

Indication	Measurement	Biak Island	Humboldt Bay	Geelwink Bay	Central regions of New Guinea (south)	Northern New Guinea	Onin Peninsula	Lawrence River	Torres Strait
1	cranial length	176.0 (35)	175.5 (32)	178.9 (82)	172.3 (58)	168.8 (91)	173.6 (12)	169.6 (33)	179.6 (19)
8	max. cranial breadth	132.0 (35)	127.2 (32)	128.4 (82)	128.1 (58)	126.8 (90)	122.4 (13)	125.1 (33)	125.8 (19)
17	basion-bregma height	131.0 (35)	129.3 (32)	132.5 (82)	128.6 (45)	127.3 (82)	125.1 (11)	127.1 (32)	129.7 (19)
8:1	cranial index	73.5 (35)	72.4 (32)	71.7 (82)	74.2 (58)	75.2 (90)	70.2 (12)	74.1 (32)	70.1 (19)
17:1	height-length index	74.5 (34)	73.7 (32)	74.1 (82)	74.8 (45)	75.6 (82)	72.3 (11)	75.2 (32)	72.3 (19)
9:8	transversal frontal index	71.3 (35)	72.2 (32)	70.3 (50)	70.7 (58)	71.3 (90)	73.3 (13)	71.0 (33)	—
40	length of the facial base	99.0 (27)	99.0 (30)	—	99.3 (30)	98.8 (79)	97.9 (11)	96.1 (32)	104.6 (17)
45	bizygomatic breadth	123.0 (32)	124.3 (31)	121.1 (62)	119.5 (47)	120.3 (80)	118.4 (10)	116.5 (27)	124.7 (18)
48	upper facial height	63.1 (28)	62.9 (31)	—	63.5 (37)	62.6 (87)	64.0 (11)	61.6 (31)	65.9 (17)
51	orbital breadth from mf (left)	41.4 (34)	40.6 (32)	—	39.4 (42)	39.5 (90)	39.7 (13)	39.2 (33)	—
51a	orbital breadth from d (left)	—	—	38.0 (50)	38.3 (20)	37.7 (46)	—	—	—
52	orbital height (left)	33.4 (34)	33.3 (32)	33.1 (78)	32.9 (53)	32.4 (91)	32.3 (12)	32.0 (33)	32.4 (19)
54	nasal breadth	25.6 (34)	24.8 (32)	26.0 (50)	24.9 (52)	24.3 (91)	25.7 (12)	24.3 (32)	24.4 (19)
55	nasal height	47.1 (34)	48.5 (32)	47.0 (50)	47.5 (52)	46.7 (89)	49.6 (12)	46.4 (32)	45.1 (19)
72	total facial angle	78.9 (26)	81.1 (31)	—	79.0 (37)	80.7 (85)	77.0 (11)	76.4 (33)	—
45:8	horizontal faciocerebral index	94.9 (32)	97.7 (31)	94.5 (62)	93.3 (47)	95.2 (79)	97.7 (10)	92.9 (27)	99.1 (18)
48:17	vertical faciocerebral index	51.3)*	50.6*	—	53.1*	52.0*	54.1*	52.9*	52.8*
48:45	upper facial index	80.6 (34)	82.0 (32)	—	83.3 (42)	82.2 (80)	81.3 (12)	82.0 (33)	
52:51	orbital index from mf (left)	51.5 (26)	50.8 (30)	—	54.1 (33)	52.0 (80)	53.3 (9)	52.6 (27)	52.8 (17)
52:51a	orbital index from d (left)	—	—	86.8 (50)	87.6 (20)	85.4 (46)	—	—	—
54:55	nasal index	54.5 (34)	51.3 (32)	55.3 (50)	52.3 (52)	52.3 (89)	51.8 (12)	53.1 (32)	54.5 (19)

*) *Index of mean values.*

ximal for mongoloids; europeoids have a middle position. The fossa canina is very slightly hollowed.

GENERAL CHARACTERISTICS

The skulls studied are not large, they are dolicho or mesocranial with heavily expressed hypsistenocephaly, narrow and comparitively straight forehead, and medium-developed relief.

The facial skeleton has small dimensions, is relatively protracted upwards, strongly prognathic. The nasal bones protrude slightly, and the root of the nose is heavily flattened. The facial skeleton has an expresive profile in the horizontal plane, expecially in its lower part. We are dealing, therefore, with an individual complex of craniological characters, which confirms the independent position of Papuans in racial systematics. Not all the ckaracters of this complex were confirmed by the craniological information. The idea of a very strong development of the relief in Papuan skulls was not, for example confirmed. There exists no evidence to support the idea of a particular prominence of the nose in Papuans. Also the flattening of the upper part of the facial skeleton in

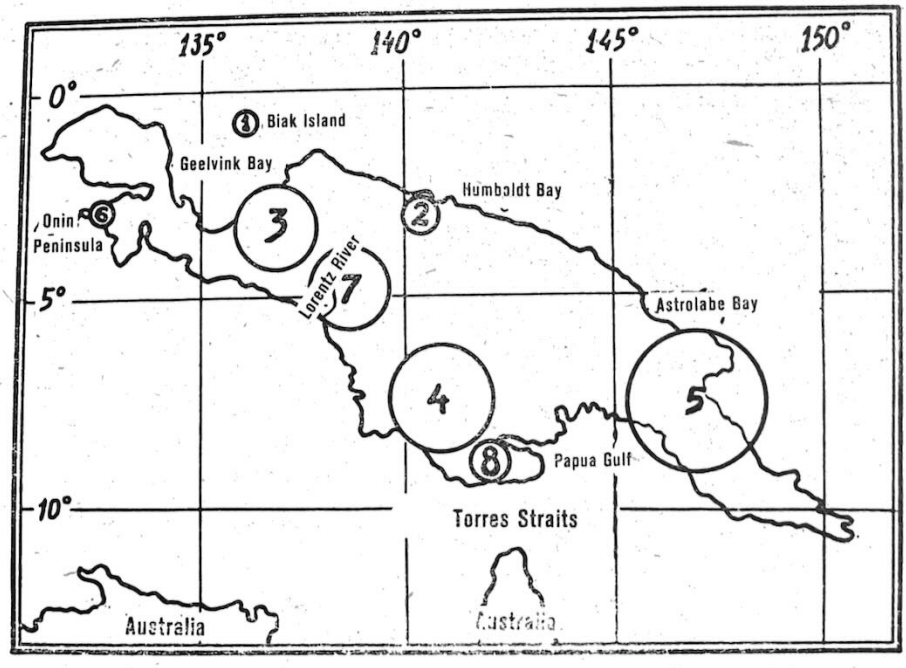


Fig. 1: Distribution of the series of Papuan skulls described. The size of the circles corresponds approximately to the area of the territories where the appropriate craniological material was collected.

Position of the sites, where the described series of Papuan skulls were collected. The dimensions of the circles roughly correspond to the size of the territories, where the respective craniological material has been gathered.

1. *Biak Island*
2. *Humboldt Bay*
3. *Geelwink Bay*
4. *The south of the central regions of New Guinea*
5. *The north-eastern regions of New Guinea*
6. *Onin Peninsula*
7. *The course of the Lorentz River*
8. *Areas around the Torres Straits*

the horizontal plane was not confirmed. In spite of this, other characters were found to be typical for this type.

GEOGRAPHICAL VARIABILITY

Before we come to the statement of the place of the Papuan type in racial systematics, we shall consider the geographical variability of the craniological characters within the Papuan group (*tab. 2—3*). The geographical position of the series used is given in *picture 1.*

1. Biak island. Information of H. Bos.
2. Humboldt bay. Material described by P. Wirtz.
3. Geelwink bay. Information on the Papuans of Geelwink bay was provided by A. Meyer and P. Mantegazza.
4. The south of the central regions of New Guinea. Here the information is provided by P. Wirtz, P. Mantegazza, E. Regalie, E. Bondy-Horowitz, W. Turner and W. Hambly. This is mostly the region between the Purani and Fly rivers.
5. The northeast part of New Guinea. In this group is included my own information, (even if with certain reserve) the material of W. Hambly and part of the material of E. Bondy-Horowitz.
6. The Onion peninsula. This group is the material described by L. Graf.
7. The basin of the Lawrence River. Information of A. van den Broek.
8. The area around the Torres strait. Information of O. Thomas.

None of the groups mentioned is geographicaly or ethnicaly homogenous. They correspond to certain collections not to the real population structure of the inhabitants of New Guinea, which has not been studied, and certainly not to the linguistic differencies which are little known. In the meantime we must go along with this.

Even by superficial observation we can recognize the series from the region around the Torres strait. It is strongly dolichocranial, so that it differs from the Papuan series; the skulls display large absolute measurements of the facial skeleton and of the brain case, and are distinguishable by a very high nose index and a great skull height in comparison with the breadth of the skull. This leads to extremely strong hypsistenocephaly, which is strange even in New Guinea. It is true that we are jumping ahead, but it is necessary to say that all the peculiarities mentioned are characteristic for the Melanesians. On the Melanesian islands there does, it is true, occur also a brachycranic element, but it has an insignificant meaning. It is on the whole probable that the morphology of the natives of the New Guinea coast on the Torres strait may be explained by intermixing of the Melanesian ethnical element, and is not connected with the basic processes of the formation of racial type; it is apparently a consequence of comparatively late intermixing. The remaining geographical differences are not great and do not form distinct geographical units. Perhaps we might note the exceptional similarity between the inhabitants of the island of Biak, those of the areas around Humboldt Bay and those of Geelwink Bay. In the central and northeast regions the height of the skull decreases, the skull index increases, and the facial breadth decreases. According to the remaining characters there are, however, differences too insignificant to allow us to classify territorial complexes based on them. The Papuan craniological type is, on the whole, judged by the existing material, homogenous enough. But the original inhabitants of New Guinea are, as is known, very numerous, and the isolation between individual villages is considerable, forming within the inhabitants tens and hundreds of populations of various sizes. The Papuan craniological type thus combines hundreds of populations and is not, therefore, characteristic of only one but rather of many ethnoterritorial groups. This is exactly the kind of case which can be clasified only with difficulty, if we can consider a race to be a population (i.e. from the point of view of the consequent negation of race) and, on the other hand, which corresponds well to the traditional concept of the existence of races as morphological or morphophysical groups, comprising great number of populations and spraed over a wide area.

ORIGIN OF THE CRANIOLOGICAL CHARACTERS OF PAPUANS

The first question which arises when judging the anthropological type of Papuans is that of their local origin, i.e. their origin in the eastern regions of the equatorial belt directly in west Oceania, or, on the other hand, the question of their direct genetical relation with African negroids. Paleoanthropological finds on New Guinea and the neighbouring islands do not exist, and so we have no opportunity to judge the age of the craniological characters of Papuans directly, and we must turn to indirect considerations, based on geographical and morphological information. In the first place, the morphological criteria were the basis of the idea of the connection of Oceanic negroids with Africans; according to these considerations morphologically similar types must have a common area, and if it does not exist today, it must have existed in earlier times (G. F. Debec 1951). Besides this, morphological characters also indicated a supposed relationship between the inhabitants of Melanesia and those of Africa. An example of their similarity is curly hair. These considerations are insufficiently justified both factologically and logically. The chain of ancient forms, which according to the idea of the proponderance of the uniformity of the negroid type, joined Africa with Oceania, has not yet been discovered; sxistence of Australian types in southern Oceanian territory have not been numerous (J. Schwidetzky, 1968). The view has been expressed that the Australoid complex served as the prototype for the formation of the negroid and europoid types, that it contains ancient characters and arose in the western regions of Afro-euro-asia (V. Alexejev, 1969). It is obvious that here, and further, protomorphy is understood to be an expression of the chronological position of this or that complex, and in no way, there-

fore, of the level of their morphological organisation. From this point of view the penetrations of Australoids into the antropological composition of southern Asia are natural, being explained as the remains of a strong penetration of original Australoids to the east. On the other hand, the coming of curly hair to the Papuans and the Melanesians occurred in a later period, as is illustrated by observing the variability of the shape of the hair during the growth of an individual (observations of M. M. Miklucho-Maklay and F. Sarasin, which were not, however, statisticaly confirmed). It is very likely that a specialized complex of characters typical for negroid Africans and including, among other characters, curly hair, was also formed comparatively late (V. P. Alexejev, 1969). We can, therefore, speak of the comparatively late and parallel penetration of curly hair in the western and eastern regions of the tropical types with dark skin. This rules out the last argument indicating a specific relationship of Papuans and Melanesians with the African negro, of which V. V. Bunak especially wrote and what is seen in his graphical scheme of the mutual genealogical relations of racial typ (V. V. Bunak, 1956). D. F. Debec opposed to the phylogenetical separation of African and Oceanic forms, or any suggestion of their systematic separation, as different races basing oo his theory of certain dichotomy in systematics in this case in racial ones. (G. F. Debec, 1958). The attempt to justify this idea appeared even in paleontology, especially in the classification of fossil labyrinthodonts (G. Sjeve-Sjöderberg). It was, however, immediately and justifiably criticised, because it was in contradiction with the whole experience of systematic studies over several decades (G. Simpson, 1944). This idea is even theoretically unacceptable, because organic forms differentiated themselves in connection with the environmental changes (no evolutionist today doubts the fact that the evolutionary process is a process of adaptation) and enviroment does not devide dichotomously; to put it another way, natural geocenoses, or basic natural regions, do not always unite in a hierarchical system with dichotomies.

Everything which has been said can be summarized as followes: The complex of characters typical for Papuans, including craniological characters, formed in the framework of the populations of Oceania, and in the Papuans are more closely related to all populations of Oceania than to African negroids. As far as a relationship with the African negroids is concerned, this relationship is not directly phylogenetical, but parallel, a consequence of the origin of both groups from a distant common ancestor.

The second question which is of interest to us in connection with the origin of Papuans, is the question of the causes responsible for the formation of their characteristic morphological complex. Hypsistenocephaly, dolichocephaly, relatively broad face, prognathism-all these characters are the remains of the original type, characteristic for the oldest populations of Australia and western Oceania. In any case, these characters exist in all the equatorial types of Oceania and even in all types of the tropical zone as a whole.

The fact that original archaic characters were preserved in interior areas of New Guinea—a slanting forehead and developed supraorbital arches (C. Le Roux, 1948)—as also the compratively strongly developed hair unite Papuans with Australians, or, to be more exact, with the original Australiods, to whom the present day Australians are closest. The insular preservation of archaic characters can be explained in this way, and also to a great extent the origin of the anthropological characters of Papuans in the somewhat inaccessible interior of New Guinea, and in a wider sense, also of all Melanesians, to whom the Papuans are most closly related. The fact that isolation played an important part in the formation of races is also indicated by the circumstance that Papuans and Melanesians occupy an extreme position (minimum or maximum concentration), as to concentration of blood groups and serum proteins genes: 100 % concentration of codominant gene N of the MN group, of codominant gene E of the rhesus group, of dominant gene e^b of the Lewis group, of dominant gene Fy^a of the Duffy group; of dominant gene Gm^a of the gammoglobulina group, and, on the other hand, of a 100 % or almost 100 % fraction of recessive allels K (Kidd group), Lu^b (Luteran group) and Di^b (Diego group). A review of the information and literature can be found in the work of H. Walter (H. Walter, 1962) and R. Kirk (R. Kirk, 1967).

The hypothesis of the conservation in isolated environmantal conditions does not, however, explain the appearance of new characters, i.e. the later appearance of curly hair. In order to clarify this situation it is necessary to return to the hypotesis of adaptive variability. It was prooved that curly hair forms a ventilation-layer around the head, which is an advantage in conditions of humid heat, when the head is overheated by the sun. The first to propose this idea, as far as I know, was O. Reche (O. Reche, 1943). This conclusion was arrived at independently by C. Coon, M. Garn, J. Birdsell (1950), and N. N. Čeboksarov (1951). It appears that it has never been proved, but seems theoretically very likely. It is interesting that we find curly hair in areas of Oceania where tropical forests with a humid, hot climate are most widespread. Curly hair is, on the Melanesian islands, identical with the occurance of maximum hypsistenocephaly, of whose adaptive significance was already mentioned. We may, therefore, attribute the later, secondary appearance of curly hair quite easily to selection processes, making possible human existence in areas with tropical forest and a very damp and hot climate (the problem of genetical adaptation in the original population of New Guinea was specially explained by R. Kirk (1967). R. Macpherson dealt with the problem of acclimatisation in his 1967 paper).

COMPARISON WITH THE MELANESIANS

Melanesian skulls were found on many islands. They are described in various degrees of detail, but are numerous enough and give an idea not only of the craniological type of the Melanesians as a whole, but also of their geographical variation. Information

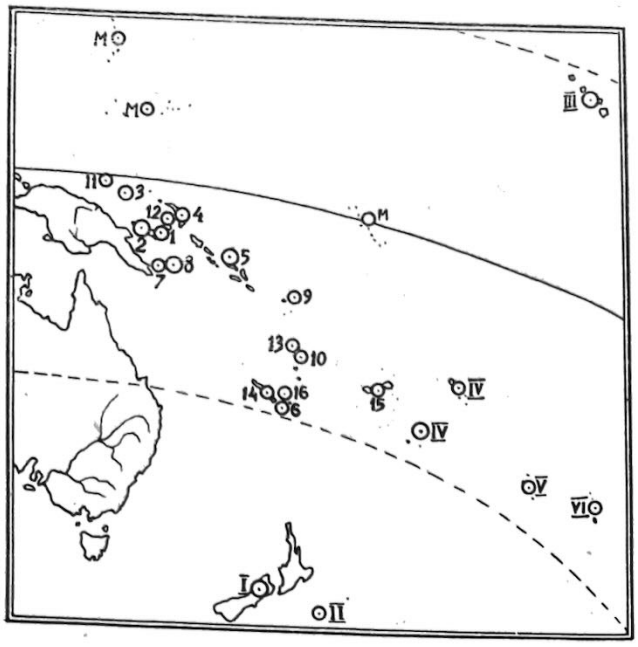


Fig. 2: The distribution of the Melanesian, Micronesian and Polynesian skull series described (in the last case the Easter Island and Marquesas Island series are not indicated). The Melanesian series are indicated by arabic numerals, the Polynesian by Roman, the Micronesian by the letter „m".

Position of the sites, where the described series of Melanesian, Micronesian and Polynesian skulls were collected. The Melanesian series are marked with Arabic figures, the Polynesians with Roman figures, and "me" — means Micronesian series.

1. New Britain (summary)
2. New Britain (Bainings)
3. Admiralty Islands
4. New Ireland
5. Solomon Islands
6. Cuni Island
7. Dawson Island
8. Woodlark Island
9. Santa Cruz Islands
10. Ambrym Island
11. Caniet Islands
12. Islands of the Duke of York
13. New Hebrides
14. New Caledonia
15. Fidji Islands
16. Friendly (Tonga) Islands
I. *New Zealand*
II. *Chatham Island*
III. *Guinean Islands*
IV. *Tonga-Samoa Islands*
V. *Cook Islands*
VI. *Society Islands*

is at present avaible on 16 island groups of Melanesia, even if two or three are from the craniological point of view unsufficient (*tab. 4—5, fig. 2*). They are summarized below, but bibliographical information is given only for those which are not mentioned by K. Wagner, who summarized the results of previous research.

1. New Britain (summary). The material of R. Krause, A. Hrdlička, W. Howells, and G. Bonin is summarized in this series. Because the series is big enough, the publication of O. Schlaginhaufen, which contains information on index variability, was not used. In the paper of G. Bonin there is summarized both his material and that of V. Müller. (G. von Bonin, 1936). As far as the work of W. Howells is concerned, no account is given of number of observations in individual characters, so this series as a whole was used in the summary mentioned (W. Howells, 1937) (*tab. 4 and 5*).

2. New Britain (Bainings). The material of L. Bauer. This series was selected according to linguistics and according to morphology; the Bainings speak one of the Papuan languages and their morphology especially in their high skull index is distinct from all the groups described from New Britain.

3. Admiralty Islands. Inextensive material of W. Turner, to which has been added a male skull from the craniological collection of the Museum of Anthropology and Ethnography; this was acquistited in 1891, totogether with other collections of N. N. Miklucho Maklay.

4. New Ireland. O. Schlaginhaufen published three series of various populations of New Ireland. Unfortunately, only indices are published. The information on all the three series is summarized together.

5. The Salomon Islands. A small series, described by A. Hrdlička. Unfortunately, only male skulls were measured. Added to them are two skulls from the Museum of Anthropology and Ethnography (212—7, 212—18). They are from the collection of N. N. Miklucho-Maklay, aequired by the museum in 1891.

6. Cuni Island. Old material, gathered in the second half of the last century, and described in the publication of A. Quatrefage and E. Hamy.

7. Dawson Island. In the D'Entrecastaux group. Series described by G. Sergi.

8. Woodlark Island in the D'Entrecastaux group. Series described by G. Sergi in the same work as the preceding series.

9. Santa-Cruz island. The material from this Island was described by E. Speiser. His information is given in tables.

10. Ambrim Island. The craniological series from this Island is described in a special monograph by W. Hambly.

11. Caniet Island. Information on the craniological type of the population of the Island is taken from the research of P. Hamburg.

12. Duke of York Island. The large series was studied and published by R. Krause, who measured only brain case diameters.

13. New Hebrides. The only material coming from this group was measured according to a rather scanty programme by A. Quatrefage and E. Hamy.

14. New Caledonia. In order to get an overall view of the population of this island the results of research by F. Sarasin and A. Hrdlička were combined. The series measured and described by F. Sarasin is so extensive that the combined datum is not very different from it.

15. Fiji. In order to get an general picture, the comparatively recent data from the work of D. Marschall and C. Snow (1956) were added to the old material described by W. Flower, A. Quatrefage and E. Hamy. The number of observations for individual characters is not given in this work, so that the total number of skulls in the series was used for the numbering of the summarized averages.

16. Friendship Island. Material of F. Sarasin.

What sort of local variability of craniological characters is there in Melanesian regions? I would stress that this is not so homegenous a complex as with the

Territorial Variation of the Craniological Type of the Melanesians ♂♂ TABLE 4a

Indication	Measurement	New Britain (summarily)	New Britain (Bainings)	Admiralty Islands	New Ireland	Solomon Is.	Cuni	D'Entrecasteaux	D'Entrecasteaux (Woodlark)
1	cranial length	183.1(358)	172.2 (42)	183.1 (8)	—	183.6 (7)	191.0 (7)	178.4 (79)	178.2 (31)
8	max. cranial breadth	132.1(358)	136.6 (42)	130.5 (8)	—	132.1 (7)	128.0 (7)	128.8 (79)	139.5 (31)
17	basion-bregma height	135.3(355)	133.7 (41)	134.7 (8)	—	135.0 (7)	138.0 (7)	135.2 (79)	136.1 (28)
8:1	cranial index	71.7(359)	79.4 (42)	71.2 (8)	71.9 (251)	72.1 (7)	67.0 (7)	72.2 (79)	78.3 (31)
17:1	height-length index	73.4(355)	77.6 (41)	73.6 (8)	74.4 (230)	73.6 (7)	72.3 (7)	75.8 (79)	76.4 (28)
9:8	transversal-frontal index	70.5*	66.8 (42)	71.9 (8)	—	—	75.0 (7)	71.1 (79)	69.6 (31)
40	length of the facial base	107.0(228) **	—	102.1(7)**	—	102.4 (7)	—	—	—
45	bizygomatic breadth	135.5(317)	131.5 (42)	127.8 (4)	—	134.1 (7)	138.0 (7)	128.4 (77)	138.3 (31)
48	upper facial height	67.7(230)	65.7 (41)	63.3 (7)	—	66.8 (7)	—	64.0 (79)	65.9 (31)
51	orbital breadth from mf (left)	44.4(60)	41.2 (41)	—	—	41.9 (7)	44.2 (7)	—	—
51a	orbital breadth from d (left)	40.7(65)	—	—	—	39.8(7)***	—	—	—
52	orbital height (left)	32.4(72)	33.8 (41)	32.2 (7)	—	31.8 (7)	34.0 (7)	31.6 (77)	32.8 (30)
54	nasal breadth	26.7(336)	26.2 (41)	24.8 (6)	—	25.9 (7)	28.0 (7)	25.5 (79)	26.0 (31)
55	nasal height	47.8(239)	48.9 (41)	49.0 (6)	—	49.1 (7)	52.0 (7)	—	—
72	total facial angle	76.8(56)	76.9 (41)	—	—	—	—	—	—
45/8	horizontal faciocerebral index	102.7*	96.2 (42)	98.9 (4)	—	102.2 (7)	107.8 (7)	99.7 (77)	99.1 (31)
48:17	vertical faciocerebral index	50.0*	50.0*	49.5*	—	49.8*	—	49.8*	47.7*
48/45	upper facial index	50.0*	50.1 (41)	49.4 (4)	53.0 (172)	49.7 (7)	—	49.8 (77)	47.7 (31)
52:51	orbital index from mf (left)	73.8(60)	81.8 (41)	—	79.6 (213)	76.3 (7)	76.9 (7)	—	—
52:51a	orbital index from d (left)	81.2*	—	—	—	79.9*	—	—	—
54:55	nasal index	56.4(239)	53.9 (41)	50.7 (6)	51.7 (231)	52.7 (7)	53.8 (7)	—	—

Territorial Variation of the Craniological Type of the Melanesians ♂♂ TABLE 4b

Indication	Measurement	Santa Cruz	Ambrim	Caniet	Duke of York Is.	New Hebrides	New Caledonia	Fiji	Loyalty Is.
1	cranial length	185.6 (29)	182.4 (20)	170.5 (18)	182.9 (82)	190.0 (5)	184.5(102)	191.3 (86)	191.3 (35)
8	max. cranial breadth	126.8 (29)	130.9 (20)	138.3 (18)	132.0 (81)	130.0 (5)	132.1(102)	130.7 (86)	130.2 (35)
17	basion-bregma height	134.8 (27)	131.2 (20)	131.6 (18)	139.4 (82)	140.0 (5)	139.4(96)	142.0 (85)	140.1 (34)
8:1	cranial index	68.4 (27)	71.8 (20)	81.8 (18)	72.2 (81)	68.4 (5)	71.7(102)	68.3 (86)	68.1 (35)
17:1	height-length index	72.8 (27)	72.1 (20)	76.6 (18)	76.2 (82)	73.7 (5)	75.7(96)	74.1 (85)	73.2 (34)
9:8	frontal-transversal index	73.6 (29)	72.0*	65.4 (18)	—	75.4 (5)	72.0(91)	73.4 (27)	72.4 (35)
40	length of the facial base	107.5 (22)	106.6 (19)**	96.2 (18)**	—	—	108.8(78)	105.3 (18)	106.0 (30)
45	bizygomatic breadth	131.3 (23)	136.2 (18)	125.7 (18)	—	132.0 (5)	136.5(97)	134.6 (2)	136.6 (34)
48	upper facial height	64.2 (24)	68.9 (19)	—	—	—	68.7(89)	69.7 (13)	70.6 (28)
51	orbital breadth from mf (left)	43.9 (28)	42.9 (20)	—	—	41.2 (5)	42.1(91)	42.0 (13)	42.4 (35)
51a	orbital breadth from d (left)	—	41.0 (20)	—	—	—	—	39.0 (6)	—
52	orbital height (left)	32.6 (28)	33.5 (20)	33.9 (18)	—	33.0 (5)	33.1(97)	34.2 (19)	34.7 (35)
54	nasal breadth	27.4 (38)	27.4 (20)	—	—	26.0 (5)	26.4(96)	26.6 (28)	26.0 (32)
55	nasal height	47.5 (26)	50.3 (20)	—	—	48.0 (5)	48.4(96)	50.4 (28)	49.8 (34)
72	total facial angle	74.4 (22)	77.8 (19)	84.9 (18)	—	—	76.6(78)	—	79.8 (33)
45/8	horizontal faciocerebral index	103.7 (23)	104.0*	90.9 (18)	—	101.5 (5)	103.4(97)	102.2 (27)	105.0 (34)
48:17	vertical faciocerebral index	48.9*	52.5*	—	—	—	50.3*	51.8*	51.7*
48:45	upper facial index	48.7 (20)	50.6*	53.2 (18)	—	—	50.4 (89)	51.8*	51.7 (28)
52:51	orbital index from mf (left)	72.9 (27)	78.1*	—	—	80.1 (5)	78.5(91)	81.7*	81.9 (35)
52:51a	orbital index from d (left)	—	81.7*	—	—	—	—	87.2 (6)	—
54:55	nasal index	57.0 (26)	54.7 (20)	—	—	54.2 (5)	54.6(96)	53.8 (28)	55.0 (27)

*) *Index of mean values.*
**) *The measurement was determined according to the alveolar point. Corrected using G. Shima's amendment.*
***) *0.5 mm added to the orbital breadth from the lacrymal point in A. Hrdlička's data.*

Papuans. The variability of characters is considerable, as are also the differences between the populations of individual islands. Most of the series dealt with is of a summary character and is not suitable for comparing territorial and ethnical populations within one island., or groups of islands. The only exception is New Britain, which is represented in our material by two series. A comparison of them shows that the differences can be considerable even between groups living on one island. Even this basic observation shows that the anthropological differentiation of the inhabitants within Melanesia is not only a result of island isolation, but also of ethnical and racial groups participating in the populations of the islands.

Territorial Variation of the Craniological Type of the Melanesians ♀♀

TABLE 5a

Indi-cation	Measurement	New Britain (summa-rily)	New Britain (Bainings)	Admiralty Island	New Ireland	Solomon Is.	Cuni	D'Entre-castaux (Woodlark)
1	cranial length	173.5 (114)	166.9 (34)	177.8 (5)	—	181.0 (6)	170.8 (39)	171.5 (8)
8	max. cranial breadth	127.7 (115)	133.8 (34)	123.2 (5)	—	124.0 (6)	125.4 (39)	136.6 (8)
17	basion-bregma height	128.4 (110)	129.1 (33)	124.6 (5)	—	133.0 (6)	127.6 (39)	132.0 (8)
8:1	cranial index	73.6 (114)	80.0 (34)	69.3 (5)	72.4 (171)	68.5 (6)	73.4 (39)	79.7 (8)
17:1	height-length index	74.1 (109)	78.0 (33)	70.1 (5)	74.0 (167)	73.5 (6)	74.7 (39)	77.0 (8)
9:8	transversal-frontal index	70.3*	68.0 (34)	71.6 (5)	—	72.6 (6)	71.8 (39)	72.2 (8)
40	length of the facial base	101.5 (81)**	—	101.1 (5)**	—	—	—	—
45	bizygomatic breadth	125.3 (90)	125.5 (34)	123.0 (3)	—	127.0 (6)	119.5 (38)	129.1 (8)
48	upper facial height	63.4 (96)	62.2 (34)	63.8 (5)	—	—	61.0 (39)	62.0 (8)
51	orbital breadth from mf (left)	40.9 (52)	40.2 (34)	—	—	42.2 (6)	—	—
51a	orbital breadth from d (left)	38.8 (31)	—	—	—	—	—	—
52	orbital height (left)	32.6 (53)	32.1 (34)	31.3 (6)	—	33.0 (6)	30.8 (37)	33.6 (8)
54	nasal breadth	25.4 (99)	25.7 (34)	23.8 (6)	—	25.0 (6)	24.6 (39)	24.3 (8)
55	nasal height	45.2 (53)	46.6 (34)	52.0 (6)	—	48.0 (6)	—	—
72	total facial angle	75.6 (40)	75.7 (34)	—	—	—	—	—
45:8	horizontal faciocerebral index	98.1*	93.7 (34)	100.3 (3)	—	102.4 (6)	95.3 (38)	94.5 (8)
48:17	vertical faciocerebral index	49.4*	49.6*	51.9*	—	—	51.0*	48.0*
48:45	upper facial index	50.6*	49.8 (34)	51.9 (3)	52.4 (119)	—	51.0 (38)	48.0 (8)
52:51	orbital index from mf (left)	79.5 (52)	80.0 (34)	—	80.1 (142)	78.2 (6)	—	—
52:51a	orbital index from d (left)	84.0*	—	—	—	—	—	—
54:55	nasal index	57.1 (53)	55.1 (34)	45.8 (6)	54.0 (130)	52.1 (6)	—	—

Territorial Variation of the Craniological Type of the Melanesians ♀♀

TABLE 5b

Indi-cation	Measurement	Santa Cruz	Ambrin	Caniet	Duke of York Is.	New Caledonia	Fiji	Loyalty Is.
1	cranial length	175.6 (24)	172.6 (11)	168.8 (4)	178.4 (28)	178.3 (56)	181.9 (27)	180.7 (28)
8	max. cranial breadth	124.4 (24)	125.4 (11)	137.0 (4)	129.0 (28)	127.1 (56)	125.0 (27)	128.3 (28)
17	basion-bregma height	127.0 (24)	127.7 (11)	123.5 (4)	135.3 (28)	133.4 (50)	139.2 (26)	132.8 (27)
8:1	cranial index	70.8 (24)	72.5 (11)	81.2 (4)	72.3 (28)	71.4 (56)	68.7 (27)	71.0 (28)
17:1	height-length index	72.4 (24)	74.0 (11)	72.0 (4)	75.8 (28)	74.9 (50)	76.6 (26)	73.5 (27)
9:8	transversal-frontal index	72.8 (34)	71.9*	64.0 (4)	—	72.0 (56)	75.1 (17)	71.1 (27)
40	length of the facial base	102.3 (23)	97.9 (11)	93.8 (4)**	—	105.1 (47)	102.7 (4)	100.6 (24)
45	bizygomatic breadth	123.9 (20)	121.9 (10)	126.0 (4)	—	126.3 (51)	124.0 (11)	125.6 (28)
48	upper facial height	61.5 (23)	62.1 (10)	—	—	65.7 (49)	—	63.2 (27)
51	orbital breadth from mf (left)	40.6 (24)	40.0 (11)	—	—	40.3 (56)	40.2 (6)	40.9 (28)
51a	orbital breadth from d (left)	—	38.1 (11)	—	—	—	—	—
52	orbital height (left)	31.4 (24)	32.6 (11)	33.8 (4)	—	32.1 (56)	33.0 (6)	33.0 (28)
54	nasal breadth	25.1 (24)	25.4 (11)	—	—	25.6 (55)	26.0 (11)	25.0 (27)
55	nasal height	44.6 (24)	45.6 (11)	—	—	45.3 (55)	46.8 (11)	45.5 (27)
72	total facial angle	75.7 (24)	78.1 (10)	81.5 (4)	—	75.9 (52)	—	77.6 (26)
45:8	horizontal faciocerebral index	99.5 (20)	97.2*	92.0 (4)	—	99.1 (51)	99.5 (11)	98.0 (28)
48:17	vertical faciocerebral index	49.6*	48.6*	—	—	52.0*	—	50.3*
48:45	upper facial index	49.9 (20)	50.9*	53.3 (4)	—	52.0 (49)	—	50.4 (27)
52:51	orbital index from mf (left)	77.7 (23)	81.5*	—	—	79.7 (56)	82.1 (6)	80.9 (28)
52:51a	orbital index from d (left)	—	85.6*	—	—	—	—	—
54:55	nasal index	56.3 (24)	56.0 (11)	—	—	56.5 (55)	55.6 (11)	55.0 (27)

*) *Index of mean values.*
**) *The masurement was determined according to the alveolar point. Corrected using f. Shima's amendment.*
***) *2.0 degrees deducted from the value of the angle measured from the alveolar point.*

If we return to the geographical variability of the craniological type in Melanesia, it is necessary to mention the centers of brachycrany, which we would not expect in most cases in eastern regions of the equatorial belt. Such centers exist in the population of parts of the D'Entrecastaux group, the Caniet Islands and part of New Britain. It is interesting that in the last case brachycrany occurs in Bainings, who speak Papuan language. This fact seems surprising, because it represents the only such case among Papuans. The horizontal measurements of the brain case and its height are also highly variable. There are also great differences in the breadth of the facial skeleton. Some groups, for example part of the population of the

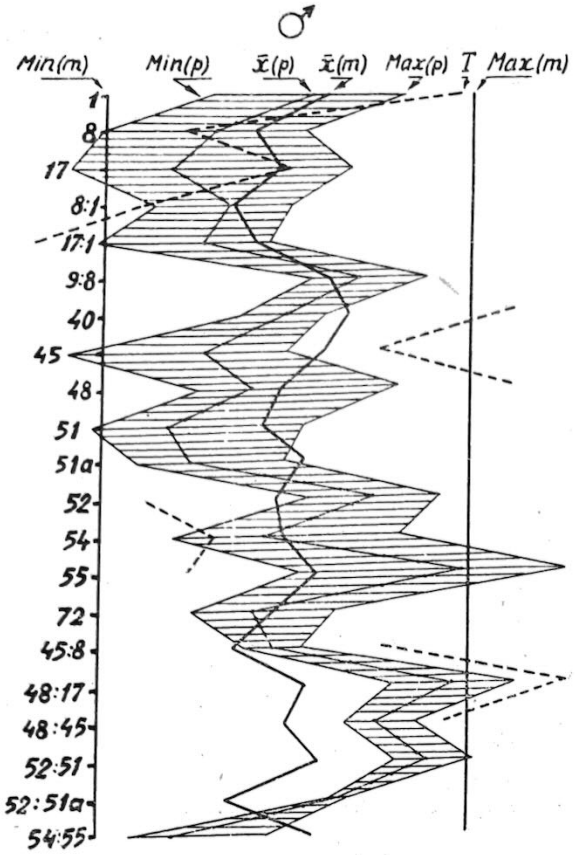
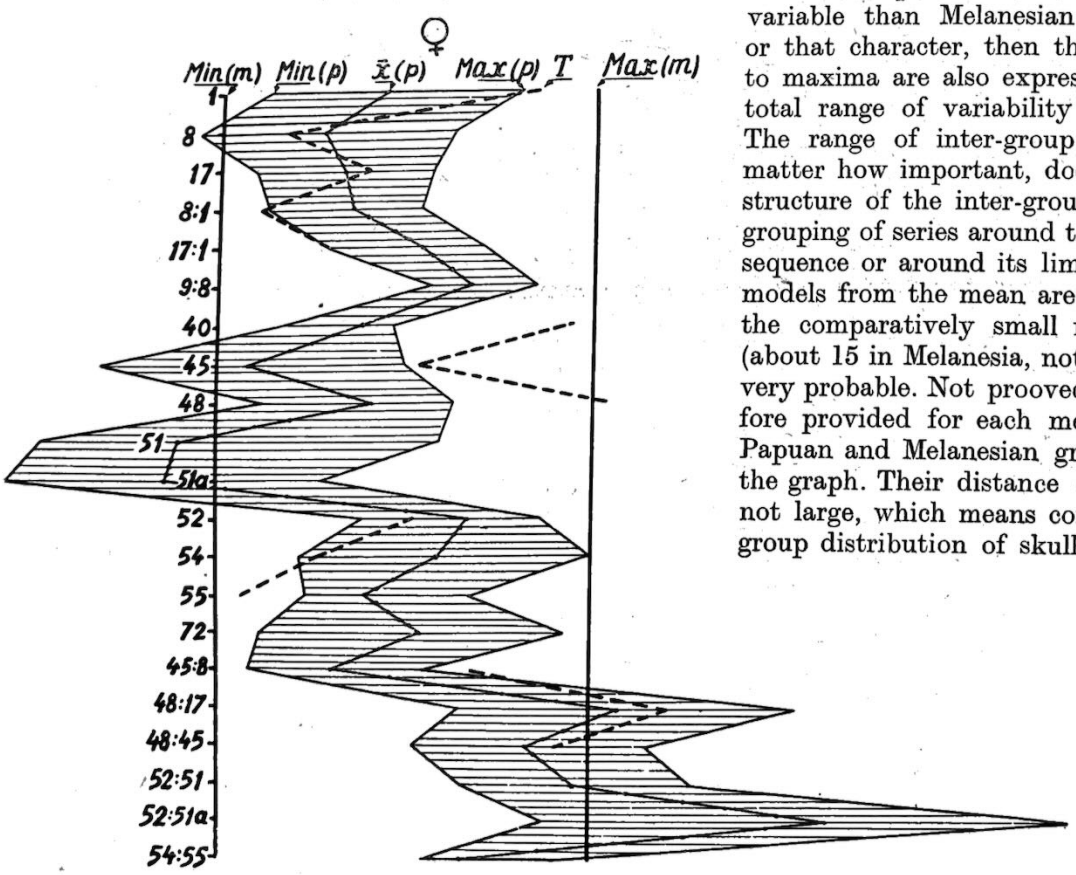


Fig. 3: Comparison of the inter-group variability of the Papuan and Melanesian series. The intra-Melanesian scale is taken as 100%. m = Melanesians, p = Papuans, T = Papuans of the Torres Strait shores. The inter-group mean values for the Papuan series are placed on the graph, naturally, according to the intra-Papuan scale, both on this and on the next graph.



D'Entrecastaux Islands, have such a wide face that they are close to mongoloids in this respect. Within the same group, on the other hand, on Admiralty Islands and on Caniet Islands, there exist gracile types with very narrow faces. The nasal index varies from the maximal value for the equatorial type (e.g. on New Britain, on Admiralty Islands and on the Friendship Islands) to values which approach the range of the europeoid race. All these variations of different characters do not form complexes taking up large geographical areas. The most typical, and very widespread complex of characters, which is usually called Melanesian, and includes dolichocrany, with a comparatively wide face, hypsistenocefaly and comparatively large skull dimensions forms an exception. This complex itself, however, includes several local variants, which are distinguished by a wide face and the value of the nasal index; more exactly, this complex is, according to these characters, polymorphic. We can therefore classify at least three morphological variants in the inhabitants of Melanesia—the typical one, under which we understand the anthropological characters of the true Melanesians, mesobrachycranial with comparatively narrow face (Bainings of New Britain) and brachycranial and orthognath with very narrow face, and orthognath (Caniet Islands). The inhabitants of Melanesia are not, therefore, as homogenous anthropologically as those of New Guinea. We may illustrate this assertion by comparing the inter-group variability of the Melanese and Papuan series (*fig. 3*). The inter-group range of variability is, for each character of the Papuan series, expressed as a percentage of the range of variability of the Melanese series. The scale of ratios within the range of variation is preserved, i.e. if Papuan skulls are more variable than Melanesian skulls according to this or that character, then the distances from minima to maxima are also expressed as a percentage of the total range of variability of the Melanesian series. The range of inter-group variability, however, no matter how important, does not give an idea of the structure of the inter-group sequence, that is of the grouping of series around the mean of the inter-group sequence or around its limits. The differences of the models from the mean are on the whole, considering the comparatively small number of groups studied (about 15 in Melanesia, not even 10 on New Guinea), very probable. Not prooved average values are therefore provided for each measurement, separately for Papuan and Melanesian groups, and are included in the graph. Their distance from the mean value are not large, which means comparatively regular inter-group distribution of skull diameters, both in Mela-

nesia and in New Guinea. The average values for Papuan skulls from the region of the Torres Straits are given on the diagram separately because of their special morphological position and unclear origin.

The diagram shows a comparatively small variability of craniological characters on New Guinea in relation to Melanesia. It is less distinct with female skulls, where the variability within the Papuan group is greater than within the Melanesian only in facial height. The second indisputable conclusion which follows from a comparison of the inter-group variability in craniological characters of Papuans and Melanesians is, that Papuans, according to nearly all characters, fall within the range of group variability of the Melanesian craniological type. With male skulls, exceptions are formed by cranial height, zygomatie diameter, nose height, and the ratio of the upper facial height to the height of the skull; with female skulls—upper facial diameter, orbital breadth and also the ratio of facial height to skull height. Thus the variations are repeated in both male and female skulls for only two cheracters. The Papuan craniological type falls completely into the framework of the Melanesian one, and does not differ from it to any great extent. This is to be seen also from a comparison of the inter-group mean values from New Guinea and Melanesia. This somewhat unexpected result leads one to consider the taxonomical question, i.e. the evaluation of the degrees of difference of the Melanesians from the Papuans and the correctness of classifying these two groups of populations as independent racial variants.

The two types are traditionally distinguished from each other on the same taxonometric level in most racial classifications. Sometimes they are considered equivalent, sometimes the Papuan type is phylogenetically associated with the Melanesian as its archaic type. Whatever the actual difference between these two hypotheses, they agree on one point, i.e. the recognition of the independence of the two types as units of racial systematics. The preceding craniological experiment, however, leads us, as we realise, to a critical approach to these hypotheses. The Papuans are practically indistinguishable from Melanesians according to craniological characters. Likewise, the somatological differences between the two population groups are not explicit. The Melanesians are considered to be a type with higher in stature and with curlier hair than the Papuans, but the first character is on the one hand very variable, both in the context of geographical area, which is of interest to us, and generally, and on the other hand is under the influence of the environment. As far as the second character is concerned, the differences have not been confirmed by accurate quantitative methods. The same also applies to the broadly distributed idea that Papuans have a special nose shape, arched in its cartilagineus part. If we compare all the most varied studies of the somatological differences between Papuans and Melanesians with the results of craniological research, which shows their striking similarity, then the craniological results are the convincing ones. In this way we get a negative answer to the question of the existence of two variants in the anthropological composition of the Melanesian population—one Papuan, widespread particularly on New Guinea, and the other of the remaining Melanesia.

The complex of morphological characters of the Papuans, is, therefore, among those characters which are proper to the Melanesian population as a whole, and whose complex has also been called the Melanesian race in racial systematics. The term is based on a geographical description, and can therefore be considered acceptable, and suitable, even if confused with an ethnical and linguistic term. Bearing in mind that there is no more suitable term, the term of Melanesian race can be occepted. One thing, however, is more important than the terminological side of the matter; that is the relative morphological polymorphism of the Melanesian group of populations, in which the Papuans hold no special place. The islanders of New Britain (meaning above all the Bainings) or the inhabitants of the Caniet Islands, differ more from the classic Melanesian type than the Papuans. The origin of these two groups, and the factors which formed their anthropological characters are not for the time being clear. As far as the remaining ethnical groups are concerned, the anthropological differences among them are apparently connected with a varying degree of island isolation and with differences in the effect of adaptational variability. If we try to classify this population heterogenity in the region of Melanesia, including the inhabitants of New Guinea, we must limit ourselves, in my opinion, to the three above mentioned local subgroups of population—the Melanesians proper, in a wider sense, the New Britains, and the Canietans. The last two sub-groups have a local character. The individuality of the New Caledonian type, distinquished by some authors, has not been confirmed by craniological information. The differentiation of the New Caledonians from the remaining Melanesians according to the degree of curliness of their hair does not have an exact quantitative proof (V. B. Bunak, S. A. Tokarev, 1956). The characters pointed out by G.F. Debec, when he characterized the New Caledonian type—dense growth of body hair, slanting forehead and robust supraorbital arches—appear even among Papuans, as I have already mentioned above, and as Debec himself pointed out.

COMPARISON WITH AUSTRALIANS

Australian craniological material has been described several times. The literature and an analysis of the studi carried out up to the beginning of the 1930ses can be found in G. Morant (1927). He summarized the mean values of the craniological characters for the whole of Australia. These mean values are, however, difficult to use, because later works appeared, which, in the first place, are based on more extensive material, and in the second place, some also include this old material. The first such work is that of A. Hrdlička, who studied enormous collections from Australian museums (A. Hrdlička, 1928). The second work is the book of K. Wagner, which has already been mentioned several times, and which investigated

Territorial Variation of the Craniological Type of the Australians (♂♂) TABLE 6

Indication	Measurement	Western Australia	Northern Australia	South Australia	Queensland	New South Wales	Victoria
1	cranial length	186.2 (33)	185.6 (124)	190.8 (223)	185.7 (92)	189.0 (73)	190.2 (90)
8	max. cranial breadth	130.2 (34)	129.3 (124)	132.8 (222)	130.3 (92)	132.7 (73)	133.9 (90)
17	basion-bregma height	131.0 (34)	135.0 (122)	130.7 (211)	135.6 (91)	134.6 (66)	136.4 (88)
8:1	cranial index	69.9 (33)	69.9 (124)	69.6 (222)	70.0 (92)	70.2 (73)	70.3 (90)
17:1	height-length index	70.4 (33)	75.6 (122)	68.6 (211)	73.0 (91)	71.1 (66)	71.8 (88)
9:8	transversal-frontal index	73.3 (16)	75.0 (15)	72.7 (24)	73.7 (42)	72.1 (14)	73.0 (16)
40	length of the facial base	103.5 (26)	106.2 (110)	106.6 (181)	103.0 (85)	103.7 (57)	107.4 (81)
45	bizygomatic breadth	133.9 (32)	135.4 (122)	135.5 (182)	133.3 (84)	134.0 (56)	138.3 (82)
48	upper facial height	68.4 (27)	69.2 (116)	69.6 (193)	68.3 (85)	69.5 (63)	70.7 (84)
51	orbital breadth from mf (left)	43.5 (17)	45.4 (16)	43.6 (25)	43.8 (43)	43.3 (14)	44.7 (16)
51a	orbital breadth from d (left)	37.8 (17)	39.0 (113)	38.6 (176)	38.7 (51)	39.0 (55)	39.2 (72)
52	orbital height (left)	33.5 (34)	33.5 (129)	33.5 (201)	33.5 (94)	33.4 (69)	33.4 (88)
54	nasal breadth	27.0 (34)	27.4 (128)	26.7 (201)	27.8 (92)	27.6 (70)	27.9 (88)
55	nasal height	48.9 (34)	49.3 (128)	48.8 (200)	49.1 (92)	49.3 (70)	49.1 (88)
72	total facial angle	75.9 (14)	77.7 (16)	78.0 (23)	78.3 (43)	79.8 (12)	77.5 (16)
45:8	horizontal faciocerebral index	102.8*	103.0*	102.0*	102.3*	101.0*	103.3*
48:17	vertical faciocerebral index	51.1*	51.3*	53.3*	50.4*	51.6*	51.8*
48:45	upper facial index	51.4 (26)	51.1 (108)	51.4 (177)	51.2 (80)	51.6 (52)	51.0 (76)
52:51	orbital index from mf (left)	75.9 (17)	78.7 (16)	76.7 (24)	74.1 (43)	78.7 (14)	76.3 (16)
52:51a	orbital index from d (left)	85.4 (17)	85.1 (113)	86.8 (177)	86.6 (51)	85.1 (55)	84.7 (72)
54:55	nasal index	55.4 (34)	55.8 (128)	54.7 (200)	56.6 (92)	56.1 (70)	56.8 (88)

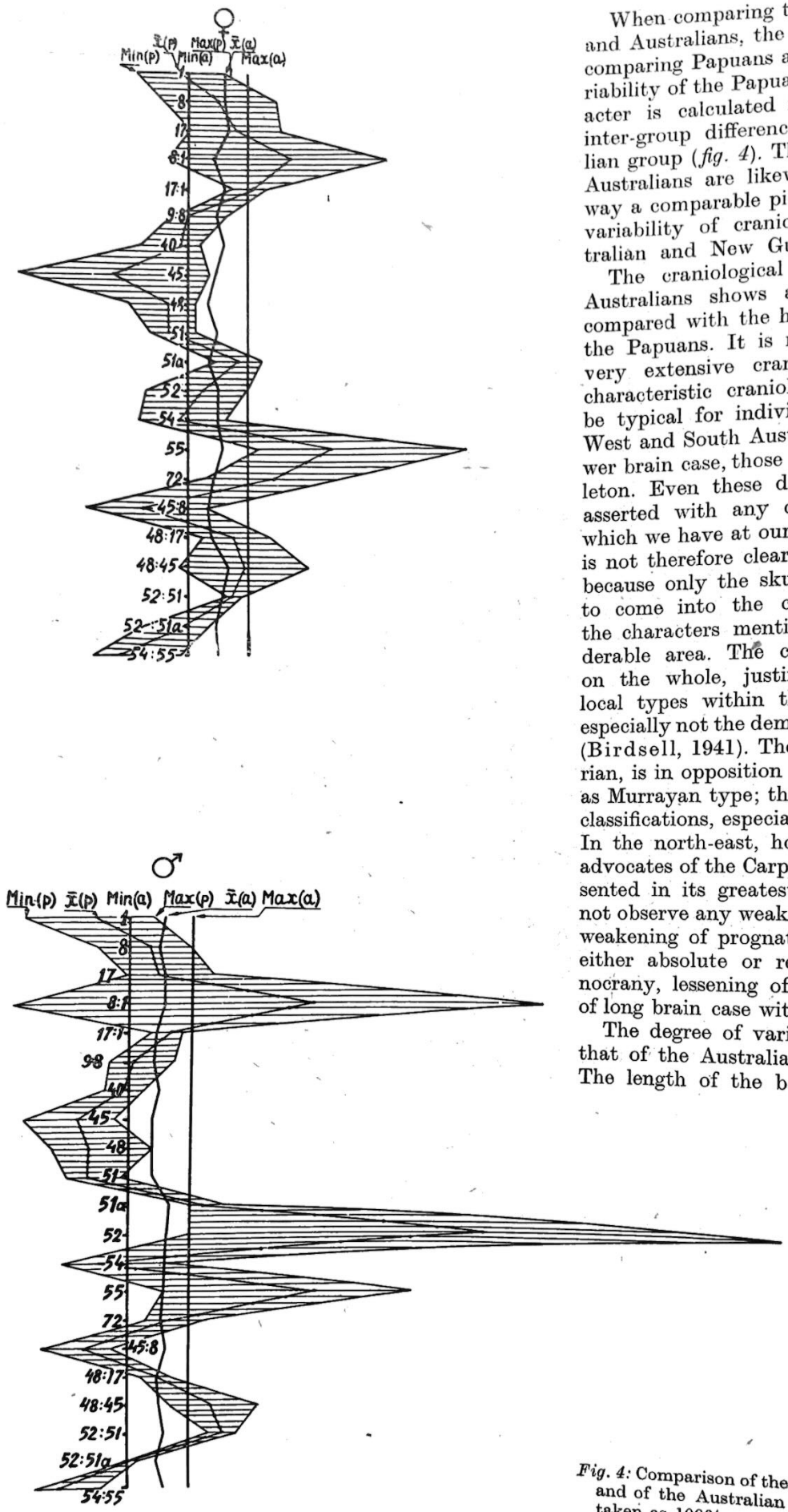
*) *Index of mean values*

Territorial Variation of the Craniological Type of the Australians (♀♀) TABLE 7

Indication	Measurement	Western Australia	Northern Australia	South Australia	Queensland	New South Wales	Victoria
1	cranial length	178.3 (14)	174.7 (90)	181.6 (158)	177.8 (63)	179.6 (44)	181.4 (49)
8	max. cranial breadth	127.4 (14)	124.6 (90)	128.4 (158)	126.9 (63)	129.6 (44)	128.7 (49)
17	basion-bregma height	128.5 (14)	128.9 (87)	125.0 (143)	128.3 (61)	129.8 (43)	128.2 (49)
8:1	cranial index	70.8 (14)	71.4 (90)	70.7 (158)	71.3 (63)	72.0 (44)	71.0 (49)
17:1	height-length index	72.1*	73.8*	68.8*	72.2*	72.3*	70.7*
9:8	transversal-frontal index	74.7 (4)	74.4 (8)	71.4 (11)	71.3 (11)	—	—
40	length of the facial base	98.8 (12)	101.6 (76)	102.0 (117)	98.8 (50)	100.5 (38)	101.4 (46)
45	bizygomatic breadth	123.0 (14)	123.9 (80)	125.0 (108)	123.5 (55)	125.7 (41)	125.9 (44)
48	upper facial height	64.0 (13)	64.7 (81)	65.2 (121)	63.8 (55)	64.1 (40)	66.0 (46)
51	orbital breadth from mf (left)	41.1 (4)	42.9 (6)	44.0 (1)	41.5 (9)	—	—
51a	orbital breadth from d (left)	38.1 (10)	37.6 (80)	37.4 (126)	37.3 (50)	37.3 (44)	37.7 (49)
52	orbital height (left)	32.8 (14)	32.9 (86)	33.3 (126)	32.9 (60)	32.6 (44)	33.4 (49)
54	nasal breadth	26.5 (14)	25.8 (84)	25.3 (127)	25.9 (59)	26.2 (43)	25.8 (48)
55	nasal height	46.2 (13)	46.1 (84)	45.6 (127)	45.6 (59)	45.3 (43)	45.9 (48)
72	total facial angle	75.8 (4)	76.0 (6)	—	77.9 (9)	—	—
45:8	horizontal faciocerebral index	97.3*	99.4*	97.4*	97.3*	97.0*	97.8*
48:17	vertical faciocerebral index	49.8*	50.2*	52.8*	49.7*	49.4*	51.5*
48:45	upper facial index	52.0 (13)	52.3 (77)	52.2 (105)	51.7 (51)	51.0 (37)	52.5 (43)
52:51	orbital index from mf (left)	77.7 (4)	83.6 (6)	75.0 (1)	83.7 (10)	—	—
52:51a	orbital index from d (left)	86.9 (10)	87.2 (80)	89.0 (126)	87.4 (50)	87.4 (44)	88.6 (49)
54:55	nasal index	57.2 (13)	55.9 (84)	55.5 (127)	56.8 (59)	57.8 (43)	56.2 (48)

*) *Index of mean values.*

collections of Australian skulls kept in England, according to the detailed programme of the biometrical school. The third and last work is the book of G. Milicerowa, where Australian skulls from the collection of G. Klaatsch are described, now kept in the Anthropological Institute of Wroclaw University (G. Milicerowa, 1955). The first two works contain the mean values connected with the series, classified according to the recognized geographical-administrative divisions of Australia. In Milicerowa's book, individual measurements are published according to the same geographical-administrative divisions. The overall mean values are laid out in the summary of all the sources according to these six divisions (*tab. 6—7*), the geographical position of the series contained is not therefore specially shown on the map. During the calculation of mean values, measurements of individual skulls from the collection of the Museum of Anthropology and Ethnography, (nos. 212—31—Southern Territory) and from the Department of Normal Anatomy of the Military Medical Academy (no. 780—Queensland) were used.



When comparing the craniological type of Papuans and Australians, the same method was used as when comparing Papuans and Melanesians. The scale of variability of the Papuan series according to each character is calculated in percentage of the size of the inter-group differences of the series of the Australian group (*fig. 4*). The mean values of Papuans and Australians are likewise given in the graph. In this way a comparable picture of the development of the variability of craniological characters in the Australian and New Guinea territories was obtained.

The craniological set of characters typical for Australians shows admirable stability even when compared with the homogenous craniological type of the Papuans. It is not possible to establish in the very extensive craniological material any locally characteristic craniological characters which would be typical for individual series. The inhabitants of West and South Australia are distinguished by a lower brain case, those of Victoria by a wider facial skeleton. Even these differences, however, can not be asserted with any certainty, because the material which we have at our disposal is composite one and it is not therefore clear whether these differences arose because only the skulls of one population happened to come into the collections studied, or whether the characters mentioned really occur over a considerable area. The craniological material does not, on the whole, justify the demarcation of several local types within the Australian population, and especially not the demarcation of an europeoid element (Birdsell, 1941). The last type, known as Carpentarian, is in opposition to the australoid proper, known as Murrayan type; this division has occurred in many classifications, especially those of American authors. In the north-east, however, where according to the advocates of the Carpentarian type, this type is represented in its greatest purity and frequency, we do not observe any weakening of australoid characters—weakening of prognatism, lessening of nasal breadth either absolute or relative, weakening of hypsistenocrany, lessening of the characteristic combination of long brain case with quite a robust facial skeleton.

The degree of variability of the Papuans exceeds that of the Australians in practically all characters. The length of the base, the breadth of the orbits,

Fig. 4: Comparison of the inter-group variability of the Papuan and of the Australian series. The intra-Australian scale is taken as 100%. a = Australians, p = Papuans.

the height-length index and the orbital indices form exceptions to this. More important, however, than the differences between the groups compared according to degree of variability, is, from the taxonomical point of view, this, the Papuans differ from the Australians in a whole series of characters. These are the measurements of the facial skeleton, the height of the orbits, the breadth of the nose and most of the indices by which the Papuan populations exceed the limits of variability of the Australian populations. Both groups, therefore, represents an independent branch in the composition of Oceanic negroids. Judging by the craniological information, local variability prevails on Australian territory. On Melanesian territory, if we take into account the incomplete spread of the basic type and the anthropological individuality of the Bainings and of the inhabitants of the Caniet Islands, the effect of typological variability prevails (V. P. Alexejev, 1957). The effect of local variation in Australia is the strict exogamy and the complicated system of dual organization, i.e. intertribal cross-connection, whereas the effect of typological variability in Melanesia is a factor in island isolation. As far as the mutual phylogenetical relationship of the two groups of populations is concerned, I am—in agreement with the idea of the archaic type of australoids, which I support—strongly in favour of regarding these as the criginal type. Arguments in favour of this idea are given elsewhere, and it is useless to repeat them (V. P. Alexejev, 1969). Such morphological individuality of the Melanesians and the Papuans, who, remember, belong anthropologically to one complex, likewise indicates the comparitively late formation of Papuans in comparison with Australians. We have, therefore, two groups of populations, or two geographical races—the Melanesian or melanesoid and the Australian or australoid, of which the second is the morphological prototype of the first. The specificity of Australians with regard to blood groups B (almost entirely absent) and N (a high percentage of individuals having group N) does not rebut what has been said, since, first of all, the same thing occurs to a lesser extent in Melanesians, and in the second place, the role of gene drift in Australia has often been pointed out, which could have led to this (J. Birdsell, 1950).

In connection with the prevalent role of local variability, the australoids are not divided into local groups of populations, whereas in the composition of the melanesoids two local groups are indicated besides the central variant, possibly even two great populations, each of which is characterized by a known anthropological specificity.

COMPARISON WITH TASMANIANS

G. Morant carried out a summary of all the craniological information on Tasmanian skulls in the same article where the summary concerning the craniology of the Australians was published, already referred to. Then followed the remarks of J. Wunderly, who thought that some skulls included in Morant's summary are not really Tasmanian (J. Wunderly, 1939). This view is not, however, entirely justified; the majority of the remaining craniological material on Australian and Oceanic areas is not fully documentated. Therefore, even though there is no complete guarantee that the whole series published by Morant is Tasmanian, it can be used with the same degree of conviction, as far as origin goes, as the remaining material. Unfortunately, Morant made a summary of only male skulls (*tab. 8*).

Average Measurements and Indices of Tasmanian Skulls ♂ TABLE 8

Indication	Measurement	n	$\bar{x}$
1	cranial length	43	182.2
8	max. cranial breadth	60	136.0
17	basion-bregma height	55	130.9
8:1	cranial index	43	74.2
17:1	height-length index	37	71.3
9:8	frontal-transversal index	—	69.1*)
40	length of the facial base	50	102.5**)
45	bizygomatic breadth	44	131.0
48	upper facial height	36	62.5
51a	orbital breadth from d (left)	40	39.3
52	orbital height (left)	60	31.1
54	nasal breadth	57	27.8
55	nasal height	58	47.1
45:8	horizontal faciocerebral index	—	96.3*)
48:17	vertical faciocerebral index	—	47.7*)
48:45	upper facial index	23	49.6
52:51a	orbital index from d (left)	40	79.4
54:55	nasal index	57	59.1

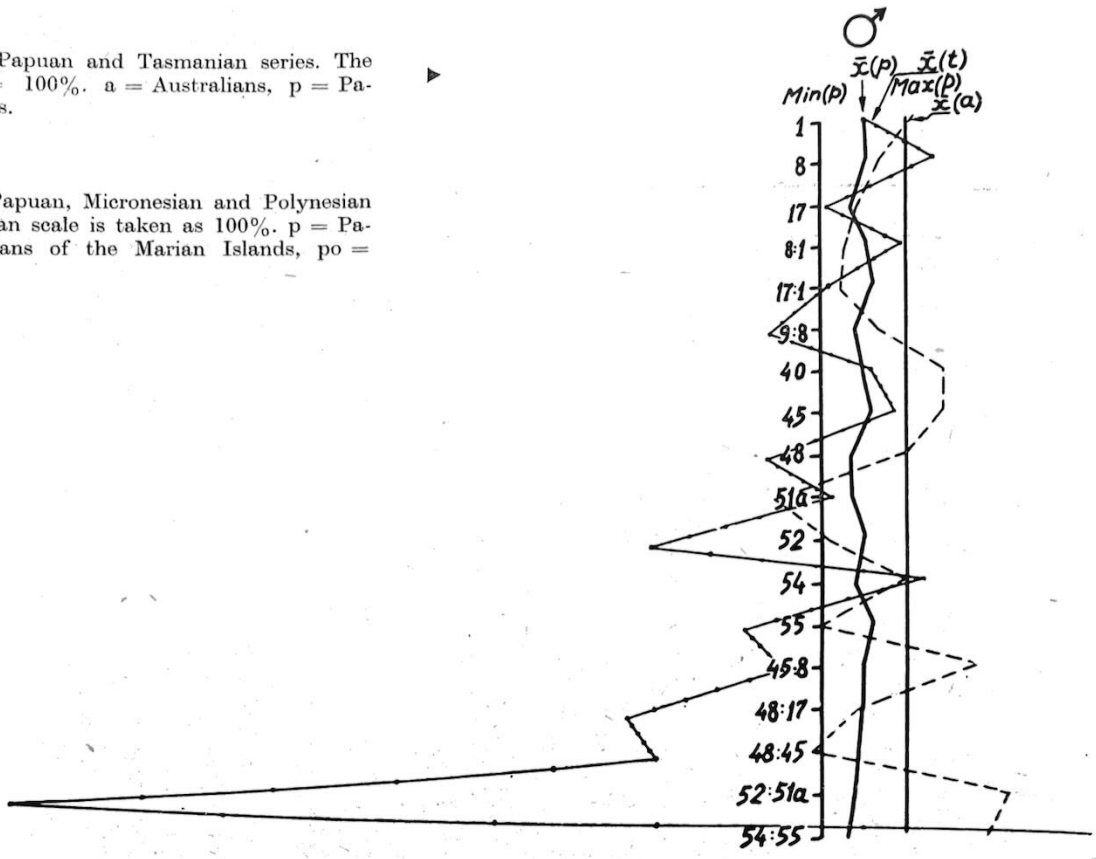
*) *Index of mean values.*

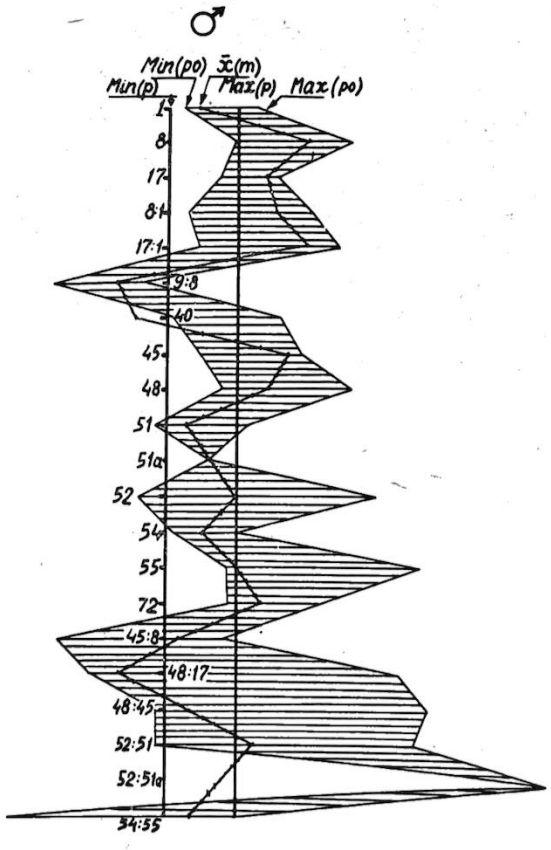
**) *With G. Shima's correction.*

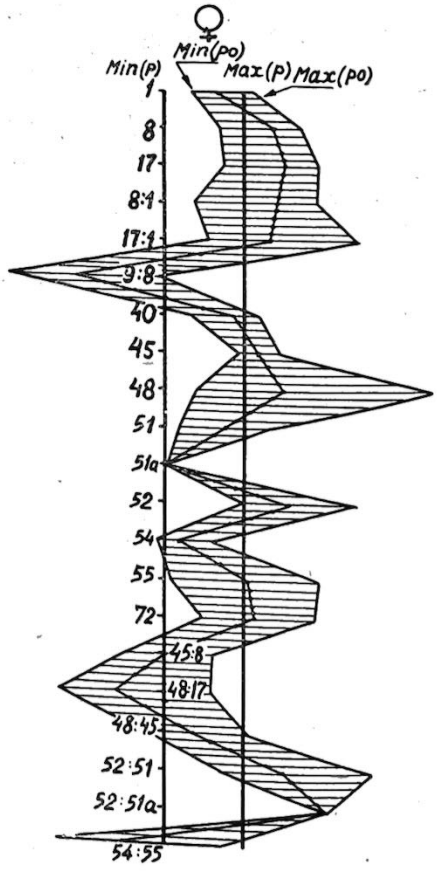
According to many characters, the Tasmanian series is outside the compass of variability of the Papuan series (*tab. 8*). The opinion is commonly held, that a conjunction of unusually small facial height, and an equally small brain-case height is characteristic for Tasmanians. According to skull height, however, the Tasmanians come within the range of variability of the Papuan populations, although they have minimal values within it. They differ, however, in reality, strongly from Papuans in a smaller facial height, and also in a smaller horizontal-frontal index, orbital height, nasal height, and in all facial indices except the nasal. According to nasal breadth and the nasal index, Tasmanians, on the other hand, differ from Papuans in having larger values. According to the relative width of the nose, and the upper facial height, they come within the limits of inter-group variability of all Oceanic groups in general (*tab. 8*). Their difference from Australians according to a whole complex of characters is also apparent. This gives us the right to single out, as G. F. Debec has already done in his work on the classification of races already mentioned, a Tasmanian group of populations, even if in doing so we use other criteria to his own-namely the characteristic

Fig. 5: Comparison of Papuan and Tasmanian series. The intra-Papuan scale = 100%. a = Australians, p = Papuans, t = Tasmanians.

Fig. 6: Comparison of Papuan, Micronesian and Polynesian series. The intra-Papuan scale is taken as 100%. p = Papuans, m = Micronesians of the Marian Islands, po = = Polynesians.







Indication	Measurement	♂ Mariana is.	♂ Caroline is.	♂ Gilbert is.	♀ Mariana is.	♀ Caroline is.	♀ Gilbert is.
1	cranial length	180.8 (41)	181.6 (33)	182.8 (16)	182.0 (5)	177.0 (11)	175.3 (6)
8	max. cranial breadth	141.0 (48)	133.8 (33)	136.8 (16)	134.8 (5)	131.0 (11)	132.7 (6)
17	basion-bregma height	141.8 (35)	141.5 (33)	141.9 (16)	138.0 (3)	139.5 (11)	137.8 (6)
8:1	cranial index	78.2 (41)	73.7 (33)	74.8 (16)	73.7 (4)	74.0 (11)	75.7 (6)
17:1	height-length index	78.1 (36)	77.9 (33)	77.6 (16)	76.9 (2)	78.8 (11)	78.6 (6)
9:8	transversal-frontal index	68.8 (40)	—	—	69.1 (5)	—	—
40	length of the facial base	100.2 (30)	—	—	—	—	—
45	bizygomatic breadth	137.6 (36)	—	—	139.7 (3)	—	—
48	upper facial height	71.0 (37)	—	—	69.8 (5)	—	—
51	orbital breadth from mf (left)	41.7 (31)	—	—	—	—	—
52	orbital height (left)	34.5 (37)	—	—	34.0 (7)	—	—
54	nasal breadth	26.5 (37)	—	—	27.6 (5)	—	—
55	nasal height	51.0 (31)	—	—	—	—	—
45:8	horizontal faciocerebral index	98.2 (36)	—	—	103.6 (3)	—	—
48:17	vertical faciocerebral index	50.1*	—	—	50*	—	—
48:45	upper facial index	51.7 (36)	—	—	50.0 (3)	—	—
52:51	orbital index from mf (left)	82.7*	—	—	—	—	—
54:55	nasal index	52.0*	—	—	—	—	—

*) *Index of mean values.*

combination of small vertical dimensions of the facial skeleton and an extraordinary large facial breadth. The similarity of Tasmanians to Melanesians according to hair shape is a secondary one. If curliness of the hair forms an adaptive character in Melanesia, then a similar process of adaptation could also have taken place in Tasmania. We do not have at our disposal any information to show a connection between these two instances of curly hair in Melanesia and in Tasmania on a causal basis. On the other hand, however, all paleoanthropological finds at present known have all the australoid characters, by no means any characteristic Tasmanian combination of morphological characters. This is also an argument in favour of the theory that Tasmanians were formed from protomorphic australoids, concurrently with the Melanesian group of population.

A comparison of the craniological type of Papuans with Tasmanians also leads to the conclusion that the racial systematics of the inhabitants of Oceania is enriched, from the taxonomical point of view, by one more independent group of populations. This group of populations was most probably formed earlier on a basis of original australoids, with the intensive influence of adaptive variability. The relation to both Papuans and Melanesians, is similar because, in the whole of Melanesia and New Guinea, similar processes of adaptation took place, but the combination of characters, which appeared influenced in a similar way, are in Tasmanians a result not of a direct, but of a collateral relationship.

COMPARISON WITH MICRONESIANS

Both racially and linguistically, the inhabitants of Micronesia represent a mixed population, which shows complicated paths of colonisation and ethnical processes occurring over whole centuries. With regard to the insufficiently studied anthropology of Micronesia, it is not easy to use the existing materia, for any raciogenetical reconstructions. In spite of thisl the summary of craniological material concerning the inhabitants of Micronesia can be to some extent useful in establishing the position of the Papuans in racial systematization. It is also useful for the anthropological classification of the inhabitants of Oceania as a whole.

Our material is summarized in *tab. 9*. It can be seen that this material is very limited and that only one series is suitable for analysis in any detail. It comes from the Mariana Islands and was compiled from the summary of O. Schlaginhaufen and from measurements of skulls from the Guam Islands, published by D. Marchall and C. Snow. There were added four male skulls from the collection of the Faculty of Normal Anatomy of the Army Medical Academy (667—670). The two remaining series, coming from the Caroline and the Gilbert Islands, were described by R. Krause (I make no reference to the literature since it is summarized in K. Wagner's book and reference is made to the works of D. Marchall and C. Snow above), unusually briefly, as is his habit, so that only three basic skull dimensions are given, the height, the width and the length. Their geographical location is given in *fig. 2* (*tab. 9*). The series from the Mariana islands is marked by an absolutely distinctive combination of characters, strikingly different from the Papuan craniological type (*fig. 6*). This is shown by the large horizontal and vertical measurements of the brain case and, in connection with this, of the cranial latero-horizontal indices, and by the large facial skeleton.

The ratio of the height of the face to that of the skull is such that the vertical faciocerebral index between Papuans and the inhabitants of the Mariana Islands shows not chance differencies, but rather in a complex of important different characters. The taxonomical place of this complex can be understood only if we use the craniological information on the inhabitants of Polynesia.

TABLE 10a

Indication	Measurement	New Zeland (Maoris)	Chatham Is. (Marioris)	Hawaian Is.	Tonga-Samoa Is.
1	cranial length	186.4 (279)	187.5 (94)	183.3 (218)	179.1 (26)
8	max. cranial breadth	138.3 (279)	142.0 (93)	143.6 (218)	145.1 (26)
17	basion-bregma breadth	138.8 (278)	136.3 (94)	141.6 (216)	142.6 (26)
8:1	cranial index	74.5 (279)	75.7**	78.5 (218)	80.9 (26)
17:1	height-length index	74.4 (278)	72.7**	77.3 (216)	79.7 (26)
9:8	transversal-frontal index	68.2 (234)	66.8**	66.0 (218)	66.4 (15)
40	length of the facial base	101.6 (272)***	102.8 (93)***	103.2 (206)***	105.3 (8)
45	bizygomatic breadth	137.0 (268)	138.9 (90)	137.0 (214)	138.0 (8)
48	upper facial height	70.8 (270)	75.8 (91)	70.3 (207)	71.3 (8)
51	orbital breadth from mf (left)	41.7 (273)	42.8 (95)	42.4 (195)	41.6 (15)
51a	orbital breadth from d (left)	—	—	—	—
52	orbital height (left)	34.9 (273)	36.7 (94)	34.6 (195)	35.2 (15)
54	nasal breadth	25.8 (271)	26.0 (95)	25.9 (214)	25.9 (15)
55	nasal height	52.2 (237)	56.6 (95)	52.5 (215)	52.7 (15)
72	total facial angle	82.5 (66)****	82.6 (33)****	83.9 (49)	—
45:8	horizontal faciocereberal index	98.5 (235)	97.9**	95.4 (214)	93.7 (15)
45:17	vertical faciocereberal index	51.0**	55.6**	49.6**	50.0**
48:45	upper facial index	51.6 (264)	54.7**	51.3 (205)	51.7**
52:51	orbital index from mf (left)	83.8 (273)	86.9 (93)	82.4 (195)	83.3 (15)
52:51a	orbital index from d (left)	—	—	—	—
54:55	nasal index	50.0 (236)	45.9 (94)	49.6 (214)	49.0 (15)

TABLE 10b

Indication	Measurement	Cook Is.	Society Is.	Marquesas Is.	Easter Is.
1	cranial length	186.3 (12)	186.6 (56)	185.2 (51)	190.6 (72)
8	max. cranial breadth	136.4 (12)	140.2 (56)	140.4 (51)	133.3 (60)
17	basion-bregma breadth	138.8 (12)	142.0 (12)	137.4 (47)	142.9 (62)
8:1	cranial index	73.0 (12)*	75.2 (56)	75.9 (51)	70.1 (60)
17:1	height-length index	73.3 (12)	75.9 (51)	74.2 (47)	75.1 (62)
9:8	frontal-transversal index	70.1 (12)	67.6 (56)	67.2 (51)	69.9**
40	length of the facial base	105.6 (12)***	105.2 (33)***	104.6 (47)***	103.8 (54)***
45	bizygomatic breadth	128.1 (12)	135.7 (53)	136.0 (49)	134.3 (52)
48	upper facial height	68.5 (12)	71.1 (37)	72.7 (49)	69.6 (55)
51	orbital breadth from mf (left)	40.8 (21)	41.2 (55)	42.5 (50)	43.3 (44)
51a	orbital breadth from d (left)	—	—	—	39.7 (34)
52	orbital height (left)	33.0 (12)	35.0 (55)	35.5 (50)	34.6 (44)
54	nasal breadth	26.0 (12)	26.4 (55)	25.7 (49)	27.3 (61)
55	nasal height	—	51.7 (38)	55.1 (34)	50.9 (60)
72	total facial angle	81.4 (11)****	80.8 (14)****	81.3 (34)****	85.8 (51)
45:8	horizontal faciocereberal index	93.9 (12)	97.3 (36)	96.8 (49)	100.8**
45:17	vertical faciocereberal index	53.5**	50.1**	53.5**	48.7**
48:45	upper facial index	53.6 (12)	51.9 (36)	53.4 (48)	51.8**
52:51	orbital index from mf (left)	80.9 (12)	85.1 (55)	83.6 (50)	80.0 (42)
52:51a	orbital index from d (left)	—	—	—	87.2**
54:55	nasal index	—	52.0 (38)	46.7 (33)	53.6 (58)

*) *The values of the cranial and height-length indices are given the wrong way round in the publication, which deos not accord with the given cranial measurements.*
**) *Index of mean values.*
***) *Measurement corrrected using G. Shima's amendment.*
****) *2.0 deducted from the value of the angle measured from the alveolar point.*

COMPARISON WITH POLYNESIAN

To put it briefly, Polynesians and Micronesians do not belong to those regions whose inhabitants could be anthropologically directly compared to Papuans. The somatological differences between Polynesians and the equatorial type of Oceania are vell known, and it is not necessary to mention them here. However, the close geographical neighbourhood of Polynesians to the inhabitants of territories under investigation leads us to deal with craniological material coming from the Polynesian islands in order to form a complete picture of the variations in craniological material over the whole of Oceania.

The review compiled by K. Wagner can be supplemented by the original material of D. Marchall

TABLE 11

Indication	Measurement	New Zealand (Maoris)	Chatham Is. (Marioris)	Hawaian Is.	Tonga-Samoa Is.	Cook Is.	Society Is.	Marquesas Is.	Easter Is.
1	cranial length	178.4 (78)	178.6 (22)	174.7 (60)	173.9 (8)	175.8 (6)	173.1 (16)	173.1 (18)	179.5 (42)
8	max. cranial breadth	133.8 (76)	138.4 (22)	138.6 (60)	139.0 (8)	138.5 (6)	135.1 (16)	136.9 (18)	129.6 (37)
17	basion-bregma breadth	133.1 (73)	132.8 (21)	135.3 (59)	139.8 (8)	136.0 (6)	134.5 (14)	130.8 (17)	137.3 (40)
8:1	cranial index	74.6 (76)	77.5 (22)	79.5 (60)	79.9 (8)	78.7 (5)	78.1 (16)	79.2 (18)	72.3 (37)
17:1	height-length index	74.2 (73)	74.5 (21)	77.6 (59)	80.4 (8)	77.7 (5)	78.0 (12)	75.7 (17)	76.5 (40)
9:8	frontal-transversal index	67.4 (54)	67.9 (22)	66.5 (60)	—	64.9 (6)	66.5 (16)	64.2 (18)	70.0***
40	length of the facial base	97.2 (71)*	98.7 (21)*	99.2 (56)*	—	99.8 (6)*	100.0 (6)*	98.4 (17)*	99.8 (31)*
45	bizygomatic breadth	127.9 (65)	128.9 (21)	127.7 (54)	—	125.3 (7)	125.4 (14)	124.1 (18)	124.3 (28)
48	upper facial height	65.8 (71)	70.0 (21)	65.8 (57)	—	63.4 (7)	62.4 (9)	67.2 (18)	62.9 (30)
51	orbital breadth from mf (left)	40.7 (73)	42.4 (21)	41.1 (46)	—	39.9 (7)	39.5 (16)	40.1 (18)	41.2 (19)
51a	orbital breadth from d (left)	—	—	—	—	—	—	—	37.7 (14)
52	orbital height (left)	34.2 (73)	35.4 (21)	34.4 (60)	—	33.4 (7)	33.5 (16)	35.2 (18)	33.9 (19)
54	nasal breadth	24.5 (73)	25.3 (21)	24.8 (59)	—	24.3 (7)	24.2 (15)	24.2 (18)	25.2 (35)
55	nasal height	51.3 (47)	52.5 (21)	49.9 (60)	—	—	47.0 (6)	52.7 (10)	46.5 (36)
72	total facial angle	82.8 (46)**	84.5 (20)	83.0 (43)	—	79.8 (5)**	79.0 (7)**	79.6 (18)**	85.5 (27)
45:8	horizontal facio-cerebral index	95.6 (65)	93.1 (21)	92.2 (54)	92.5 (6)	90.5 (6)	93.1 (8)	90.8 (18)	95.9***
48:17	vertical faciocerebral index	49.4***	52.7***	48.6***	—	46.6***	46.4***	51.4***	45.8***
48:45	upper facial index	51.4 (63)	54.3 (21)	51.5 (53)	—	50.7 (7)	49.6 (7)	54.3 (18)	50.6***
52:51	orbital index from mf (left)	84.3 (73)	84.3 (21)	84.5 (46)	—	83.7 (7)	84.9 (16)	87.8 (18)	82.5 (19)
52:51a	orbital index from d (left)	—	—	—	—	—	—	—	89.1***
54:55	nasal index	49.0 (46)	48.2 (21)	49.9 (59)	—	—	51.1 (6)	46.8 (10)	54.2 (35)

*) *Corrected according to Shima's amendment.*
**) *2.0 deducted from the value of the angle measured from the alveolar point.*
***) *Index of mean values.*

and C. Snow. The result is craniological information on eight groups of islands (*tab. nos. 10—11, fig. 2*).

1. New Zealand. This craniological series concerns Maoris. It is the material of K. Wagner, F. Lushan, G. Scott, D. Marchall and C. Snow. To this have been added individual skulls from the Museum of Anthropology and Ethnography (212—30) and from the Army Medical Academy (781—782).

2. Chatham Island. The series represents Mariors. It is compiled from the data of E. Tomson, G. Scott, D. Marchall and C. Snow. A skull from the M.A.E. collection (212—21) is included.

3. The Hawaian Islands. The summarized series from the information of W. Tanner, D. Marchall and C. Snow.

4. The Tonga-Samoa Islands. Old information, from R. Krause, A. Quatrefage and E. Hamy, supplemented by a small series described by D. Marchall and C. Snow.

5. The Cook Islands. Material described by F. Lushan.

6. The Society Islands. Results measured by A. Quatrefage, E. Hamy and F. Lushan are supplemented by the information of D. Marchall and C. Snow.

7. The Marquesas Islands. A summarized series compiled from the material of F. Lushan, K. Wagner, D. Marchall and C. Snow.

8. Easter Island. A large craniological collection from the territory of this island described by G. Bonin. It is combined with the results of the earlier publication of W. Boltz. The results of this summarization are given in the tables.

The craniological type of the Polynesians is thus sharply differentiated from the Papuan one, as in the foregoing example, when we compared Papuans with the inhabitants of the Mariana Islands. The difference occurs both in the degree of variability and in the summary of characters (*fig. 6*). Polynesians are especially polymorphic in the skull and the height-length index, according to the facial dimensions, according to orbital height, the nasal height, average dimensions of the face and brain case, and according to the orbital and nasal indices. On the other hand, they are very different from Papuans in facial angle, which is comparatively constant. The nasal breadth is also constant, although there is no difference in this character compared with Papuans. The most striking difference, however, craniological, between Papuans and Polynesians, is not in the degree of variability, but in the summary of characters. Polynesians have rounder and higher skulls. The facial skeleton is higher, wider, and, what is still more important, much more orthognath than with the equatorial forms. This complex of craniological characters comes within the Polynesian race which

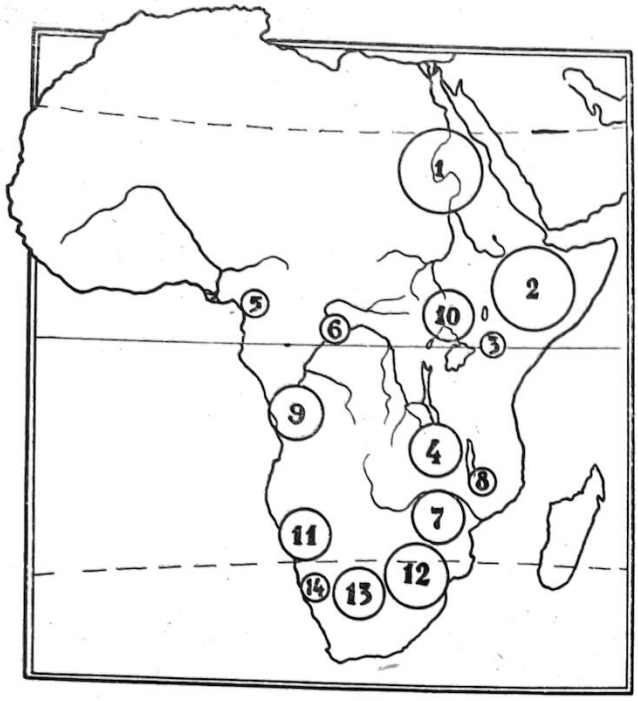


Fig. 7: The distribution of the craniological series of African nations. The size of the circles corresponds approximately to the size of the territories on which the appropriate craniological material was collected.

Position of sites containing the skull series of the African populations. The dimensions of the circles roughly correspond to the size of the territories, where the respective craniological material has been gathered.

1. *Egyptian Negroes*
2. *Ethiopian Gallas and Somalis*
3. *Teita Negroes*
4. *Areas adjacent to Lake Tanganyika*
5. *Western regions of the Cameroons*
6. *The Congo River*
7. *The Zambezi River*
8. *Regions south of Lake Nyassa*
9. *Gabon Negroes*
10. *Ugandan Negroes*
11. *South West Africa*
12. *South-east Africa*
13. *Hottentots*
14. *Bushmen*

was first determined and adequately described by I. E. Deniker (1900). The somatological characteristics, i.e. comparatively light skin and slightly wavy hair, supplement this craniological characters. For a short review of the data and the literature, see L. Sullivan, Race Types in Polynesia, (1924), H. Shapiro, (1943). The independence of the Polynesian groups is therefore beyond doubt. The inhabitants of the Mariana Islands belong to this group also. Its name, even if based on a geographical principle, is not entirely satisfactory, just as in the preceding examples with the Tasmanian, Australian and Melanesian groups, because of confusion with ethnical terms. A better and universal term does not, however, for the time being exist, so that we must restrict ourselves to suggesting that the old term be replaced by a new one, while, however, continuing to use the old one.

What are the basic factors and stages in the formation of the Polynesian groups of populations? It has often been written that this is one of the most complicated questions of world racial history. It has been resolved in many different ways, and the Polynesians have more than once been grouped into each of the three usual great-race classifications. A definite choice between the three races is now apparently impossible, as a result of the relatively great knowledge of the paleoanthropology of South-East Asia and the almost complete lack of it for Oceania. From the author's point of view, the comparatively light skin and straigt hair, or hair in large waves, in Polynesians, prevent them from being classed with the equatorial forms. The hypothesis of the europeoid appurtenence of Polynesians, which E. Eickstedt defends (1928), even if it is totally in keeping with the morphological criterion, is in contradiction with the geographical one. Finally, the classification of Polynesians as mongoloid, which was done by H. Vallois (1948), also meets with morphological difficulties—there exist no specific mongoloid characters in the structure of the ocular regions, there is comparatively strong tertiary hair-covering and comparitively strong nasal prominence. The author considers most likely the hypothesis of G. F. Debec, according to which the Polynesian group of populations was formed in a process of mixing of mongoloid and equatorial groups (G. F. Debec, 1956). This makes it more likely that the settlement of Polynesia occurred comparatively late, when the typological characteristics of both the mongoloid and the eastern negroid groups had been already definitively formed. Even this hypothesis, however, does not explain the formation of all the various characters of the anthropological type of the Polynesians; the measurements of the facial skeleton are no smaller than those of classical mongoloids, the cranial height is strikingly large, and the nasal bones protrude more strongly than one would expect with a mixture of negroids and mongoloids. As can be seen, we can find a way out of this difficulty only by supposing that the mongoloid form which took part in the mixing was represented by the protomorphic mongoloids similar to those discovered in the Upper cave in Chou-Kou-Tien (F. Wiedenreich, 1939). N. N. Čeboksarov very successfully divided the mongoloid race into two branches—the continental and the Pacific one (N. N. Čeboksarov, 1947). Among the representatives of the Pacific group, he found, among other characters, great cranial height. The protomorphic representatives of this Pacific group were probably therefore a transient group, which was, in the mixing with Oceanic negroids, the basis of the Polynesian population. Early enthusiasm over the hypothesis of T. Heyerdal concerning the connection of Polynesians with American Indians, (which, incidently, was based on the morphology of the two groups and upon the indentical incidence of blood groups), later changed

Geographical Variation of the Craniological Type of African Negroes ♂♂ TABLE 12a

Indication	Measurement	Egypt	Ethiopia (Galla and Somalians)	Kenya (Teita)	Lake Tanganjika (Mixed series)	Western Cameroons (Mixed series)	Congo River Region (Batatelas)	Zambesi River Region (Zulu)
1	cranial length	179.7 (35)	181.9 (37)	183.9 (53)	180.8 (38)	180.1 (85)	177.9 (50)	184.2 (20)
8	max. cranial breadth	134.5 (35)	134.2 (36)	129.6 (54)	130.4 (38)	138.8 (84)	138.5 (50)	137.1 (19)
17	basion-bregma height	133.5 (35)	132.2 (28)	130.8 (44)	129.4 (38)	135.0 (84)	133.8 (48)	138.1 (20)
8:1	cranial index	75.0 (35)	73.9 (36)	70.6 (53)	72.0 (36)	76.8 (84)	78.0 (50)	74.3 (19)
17:1	height-length index	74.8*	73.1 (28)	71.4 (43)	71.6 (37)	74.8 (84)	75.4 (48)	75.0 (20)
9:8	transversal-frontal index	70.5*	70.6*	74.3*	74.0*	69.8*	70.4*	72.8*
40	length of the facial base	101.9 (34)**	97.5 (25)**	101.5 (31)**	—	103.9**	97.8 (47)**	103.2 (18)**
45	bizygomatic breadth	128.7 (35)	128.2 (24)	130.9 (27)	129.1 (36)	134.2 (86)	126.5 (33)	133.1 (15)
48	upper facial height	67.4 (33)	67.7 (26)	68.5 (32)	68.3 (36)	67.9 (86)	63.4 (49)	69.5 (19)
51	orbital breadth from mf (left)	—	—	43.4 (48)	41.1 (38)	—	40.4 (47)	38.7 (20)
51a	orbital breadth form d (left)	38.1 (35)***	39.3 (18)***	39.5 (23)	39.7 (38)	40.9 (86)	—	—
52	orbital height (left)	32.5 (35)	34.2 (31)	34.0 (48)	34.4 (38)	34.5 (86)	34.6 (47)	33.2 (20)
54	nasal breadth	25.9 (34)	25.3 (28)	27.6 (47)	26.7 (38)	27.5 (86)	26.0 (50)	27.3 (20)
55	nasal height	48.4 (34)****	49.3 (28)	47.1 (39)	48.2 (37)	49.1 (86)	47.2 (49)****	47.2 (20)****
72	total facial angle	—	—	81.3 (27)	—	77.7 (85)*****	84.3 (47)	—
45:8	horizontal faciocerebral index	95.7*	95.5*	101.0*	99.0*	97.2*	91.3*	97.1*
48:17	vertical faciocerebral index	50.5*	50.8*	52.5*	52.8*	50.3*	47.4*	50.3*
48:45	upper facial index	52.4*	52.8*	52.3*	52.9*	50.6*	50.1*	52.2*
52:51	orbital index from mf (left)	—	—	78.3 (46)	83.7*	—	85.7 (47)	85.8 (20)
51:51a	orbital index from d (left)	85.3 (36)	86.0 (18)	86.1*	86.6*	84.4*	—	—
54:55	nasal index	54.0 (34)	52.2 (25)	58.3 (36)	55.4*	56.0*	55.2 (49)	58.0 (20)

Geographical Variation of the Craniological Type of African Negroes ♂♂ TABLE 12b

Indication	Measurement	South of Lake Nayssa (Angonis)	Mouth of Congo R. (Gabun)	Uganda	South West Africa (Mixed series)	South East Africa (Khosa)	Hottentots	Bushmen
1	cranial length	184.3 (25)	180.2 (68)	183.1 (94)	187.9 (34)	188.7 (59)	185.3 (34)	180.4 (99)
8	max. cranial breadth	134.6 (25)	136.2 (68)	133.1 (93)	134.6 (34)	137.3 (58)	133.4 (34)	134.0 (98)
17	basion-bregma height	137.0 (24)	135.7 (68)	127.4 (89)	133.9 (34)	136.7 (57)	130.4 (34)	126.8 (92)
8:1	cranial index	73.0 (25)	75.6 (68)	72.7 (93)	71.6 (34)	72.9 (57)	72.0 (34)	74.1 (98)
17:1	height-length index	74.2 (24)	75.4 (68)	69.7 (88)	71.3 (34)	72.4 (57)	70.4 (34)	70.4 (92)
9:8	transversal-frontal index	72.8*	71.2*	72.2 (92)	—	72.9*	71.4*	70.7*
40	length of the facial base	104.8 (24)**	102.3 (63)**	99.9 (76)	102.6 (28)	105.8 (56)**	99.8 (33)**	96.6 (79)**
45	bizygomatic breadth	—	130.0 (62)	128.3 (76)	132.5 (29)	132.9 (55)	125.9 (31)	124.0 (80)
48	upper facial heigth	70.3 (25)	66.6 (65)	68.3 (76)	69.0 (28)	69.4 (58)	65.0 (33)	61.5 (82)
51	orbital breadth from mf (left)	38.2 (20)	41.7 (68)	42.3 (77)	—	—	42.5 (6)	41.8 (42)
51a	orbital breadth form d (left)	—	—	—	39.1 (32)	39.8 (51)***	38.2 (26)	38.2 (39)
52	orbital height (left)	33.3 (22)	35.1 (68)	33.8 (77)	33.3 (32)	33.8 (59)	32.0 (32)	31.1 (88)
54	nasal breadth	28.0 (25)	26.7 (68)	25.7 (81)	28.2 (31)	27.3 (58)	26.7 (32)	26.1 (88)
55	nasal height	48.5 (25)****	48.1 (68)****	47.5 (80)	48.8 (31)	48.5 (42)	45.9 (32)	44.5 (87)
72	total facial angle	—	—	77.9 (70)	—	—	82.5 (6)	81.8 (42)
45:8	horizontal faciocerebral index	—	95.4*	96.4*	98.4*	96.8*	94.4*	92.5*
48:17	vertical faciocerebral index	51.3*	49.1*	53.6*	51.5*	50.8*	49.8*	45.9*
48:45	upper facial index	—	51.2*	53.3 (71)	52.1*	52.2*	51.6*	49.6*
52:51	orbital index from mf (left)	88.1 (20)	84.4 (68)	81.0 (82)	—	—	72.6 (6)	74.6 (42)
52:51a	orbital index from d (left)	—	—	—	85.2 (32)	85.4 (51)	84.8 (26)	81.4 (39)
54:55	nasal index	58.0 (25)	55.6 (68)	54.6 (80)	57.8 (31)	56.5 (42)	58.5 (32)	59.0 (87)

*) *Index of mean values.*
**) *Corrected using G. Shima's amendment.*
***) *Measurement measured from the lacrimal point.*
****) *Measurement determines lower edge of the nasal aperture.*
*****) *2.0 degrees deducted from the value of the angle measured from the alveolar point.*

to a sceptical attitude, towards it, because it was later convincingly shown that it is possible to explain the similarity of morphology and of blood groups by the fact that they come from the oldest inhabitants of north-east Asia, in other words, from a population spread taking place from one centre (Ja. Ja. Roginski 1966, 1968).

Together with the taxonomical groups of populations which can be called australoid in the widest sense of the word, or protomorphic Euro-African races (Aleksejev, 1969), there exist, therefore, in Oceania, mixed forms, coming from protomorphic mongoloids, who mixed with some sort of australoids, most probably with the representatives of the Melanesian racial complex. The last assumption leads automatically to the conclusion that the racial type of the Polynesians was formed only during the settlement of their present-day territory.

COMPARISON WITH AFRICAN NEGROIDS

In using this term, I mean the native inhabitants of Africa south of the Sahara, including those people speaking Khoisan languages. Accordingly, our comparative table has been compiled to include a summary of the craniological material from all African territory south of the Sahara (*tab. 12*). Right at the start I would mention that in its compilation, the detailed information published by J. Czekanowski concerning the inhabitants of South Africa was not used, since that would require a significant amount of preparation in determining the appurtenance of individual series, and in determining the mean values (J. Czekanowski, 1951). The geographical situation of all material used is given in *fig. 7*. In the great majority of cases only male skulls were studied, which resulted in the fact that we did not make a summary

of the information on female skulls, which are not numerous.

1. Negroes of Egypt. This is a heterogenous series, for which skulls were chosen according to a morphological principle, i.e. according to the degree of significance of negroid characters. They were measured by various authors. The overall mean values have been calculated and published by E. Kitson (1931). There exists no information as to the ethnical appurtenance of skulls from this series.

2. Gallas and Somali of Ethiopia. Basically, it would apparently be more correct to say that the whole series represents the inhabitants of the eastern regions of Ethiopia and Somalia, but in the table the geographical definition of E. Kitson is presented. For mean values E. Kitson summarized the measurements of various authors.

3. Negroes of Teita (Kenya). This is a tribe speaking the Bantu language; craniological material was described by E. Kitson.

4. A heterogenous sesies from regions neighbouring on Lake Tanganyika. The craniological materia comes from the area south of the lake, i.e. from the west of Tanzania, and represents six tribes: the Sanl dawe, the Tiru, the Burunga, the Issangu, the Kindiga and the Irangu. A. Reed published the material; after his publication it was included in the general information of E. Kitson.

5. The western regions of the Cameroons. These are skulls of various types, measured by K. Dronči-lov. The mean values were calculated and published according to his measurements by E. Kitson.

6. The River Congo, Batatela tribe. This is the middle reach of the river. The Batatela are a part of the Bantu people. The series was described by R. Benington (1912).

7. Zulu, Zambesi river region. The skulls are from the region to the south of the Zambesi, from Botswana territory and from Southern Rhodesia. They were measured by F. Schraasall, according to whose individual measurements R. Benington calculated and published mean values.

8. Regions to the south of Lake Nyassa. This is the territory of south Tanzania. In ethnical relation it represents material from Angons and is described by R. Benington.

9. The Gabun negroes. These are several groups speaking the Bantu language, which inhabit regions to the south of the mouth of the Congo. R. Benington for some obscure reason, described two series of skulls, which come from the area of the township of Fernando-Vaz. The only difference between them is that one series was obtained in 1864, the other in 1880. The skulls of the second group, are, it must be said, somewhat larger than those of the first, but this is the only morphological difference between them. For our purposes both series are summarized and given in the table together.

10. Uganda. S. Gurnyj published quite complete measurements on nearly 200 skulls found by E. Lot in Uganda in 1938—39 (S. Gurnyj, 1957). The ethnical type of these skulls is rather uncertain, they apparently belong to the repsesentatives of various Bantu speaking groups. I have given in the table the calculated mean values for his male series.

11. South-West Africa. This is a heterogenous series, which represents the south-west branch of the Bantu. Included in it are skulls of members of various tribes, especially the Ovambo and Damara. The material was studied by A. Hrdlička (1928).

12. South-East Africa. A heterogenous series which involves those groups of tribes which were collectively known as Kafers in old ethnographical literature. Theyare present-day Xosa. According to they measurements of various authors, E. Kitson calculated the mean values for this series and published them.

13. Hottentots. To the heterogenous series published by E. Kitson is added material studied by H. Pacher. Pacher doubts that all the anthropological material published before her belonged to Hottentots, but the series which she had at her disposal is documentated neither better nor worse than the previous ones. These are also, therefore, given together.

14. Bushmen. The Bushman series, whose mean values were calculated and published by E. Kitson, is, like the Hottentot one, compiled from the measurements of various authors. It is summarized in the craniological material researched by H. Pacher.

What are the characteristics of the craniological type of the African populations, if any? In comparison with the other racial types of the world, they are characterized by a wide nose, prognathism, hypsistenocrany. However, we can observe the same characters even in the craniological material from Oceania. It is interesting that hypsistenocrany is in Oceania, for example, judged to be connected with the African populations, yet is considerably more strongly developed than in Africa; in African territory there is not even one group with a height-width index higher than 100, but in Oceania these groups are the rule. Prognathism is also substantially smaller in Africa than in the Melanesian and Australian populations—only one group in Africa (Uganda) shows the same value of the facial profile angle as the Oceanic groups. The width of the nose is more stable with the negroes than with the Oceanic groups, but even among them we meet with populations closely approaching the values of the nasal index and the absolute breadth of the nasal aperture of southern europeoids. More important in the differentiation of African negroids from Oceania is the conjunction of skull and facial measurements—comparatively gracile facial bones and constant dolichocrany (only the central regions along the banks of the middle reaches of the River Congo form an exception), which conditions the comparitively low values of the facial and facio-cerebral indices. It is especially important to note the very high orbital index, although the absolute measurements of the orbits are in average even lower than in Oceania (*fig. 8*).

The individuality of the negroid complex in Africa is, therefore, quite great, but this complex as a whole is not distinct from the Oceanic groups. The taxonomical position of this group of populations is probably not higher than that of large groups existing among the inhabitants of Australia and Oceania. The somatological information accor-

ding to skin colour makes direct comparison of the two impossible, and as far as hair is concerned, the curliness of the Papuan hair is not less than that of African negroes. In any case neither darker skin nor greater curliness of the hair in negroes can be considered crucial. The customary division of negroid or equatorial races into two branches—African and Oceanic—must, therefore, be added to geography and tradition rather than to morphology. The systematics of the equatorial race becomes, therefore, in the light of these ideas, an extremely complicated task, because a single race now falls into several sub-divisions, but this systemization also becomes less schematic and more concrete. African negroes are, understandably, referred to in a narrow sense of the word. Representatives of the Khoisan group of languages, Bushmen and Hottentots, in view of their craniological and somatological differences, deserve classification into an independent racial group, outside the negroids themselves. The term "Khoisan" is an unfortunate one, because it is linguistic, and in no way geographical; it would seem to be better to call this group South African as distinct from true African. On the other hand, Pygmies, apart from body height, and its associated changes in body proportions, and apart from neoteny, are scarcely distinguishable from negroes. They should therefore belong to the African population group. The independent and real existence of local types comprised in the group is insufficiently supported by objective information; in any case the taxonomical position of such local types is not any higher than that of local populations of Melanesians, as for example the inhabitants of the Caniet Islands. In the structure of the equatorial or negroid branch of the euro-african race is included a protomorphic group of australoids or an Australian group of populations (this group may again, on the other hand, be differentiated in that we classify separately australoids and the original inhabitants of Australia) and then, on roughly the same level, there appear four neomorphic groups—Melanesian, Tasmanian, true African and South African.

The origin of the anthropological complex which represents the African populations follows from a comparison of various characters of negroes and Australians. The negro groups are more gracile, therefore a parallel process of formation of populations with curly hair took place in Africa, on the basis of some group with curly hair, which is a similar process to that which took place in Oceania. A reduction of hair-covering also took place. Adaptive variability apparently played a fundamental role in this. On the other hand, if we retrace our steps a little, we can say that this variability also played its own role in the formation of the anthropological plasticity of the present-day Australians, but appeared in a different complex of characters—hypsistenocephaly is stronger in Australians than in negroes approaching the neutral type, which apparently was nearer the original. As far as the origin of the South African group of populations is concerned, the adaptive role of the pseudomongoloid complex of characters has been pointed out in a special paper; it is characteristic of the South African population under Kalahari desert conditions. This paper, however, represented the formation of this complex of mongoloid characters in connection with the environmental influence (S. A. Semenov, 1951). The varied character of the inheritance of epicanthus in classical examples of the mongoloid race and in Bushmen and Hottentots gives us some reason to assume that we have here an example of the parallel phenotypical origin of similar or even identical characters (Fisher, 1930). This makes the hypothesis of the mongoloidity of the South African populations, initiated by E. Eickstedt, very doubtful. The theory of the relationship of South Africans to African negroes is extremely widespread in scientific literature on races. It seems to be very justified both from a morphogenetical and from a geographical point of view.

CONCLUSIONS

The general conclusion of the preceding investigation can be reduced to the fact that in the structure of the inhabitants of Oceania there are several independent groups of populations, distinguished by an general complex of craniological characters. These groups of populations can be called races, either

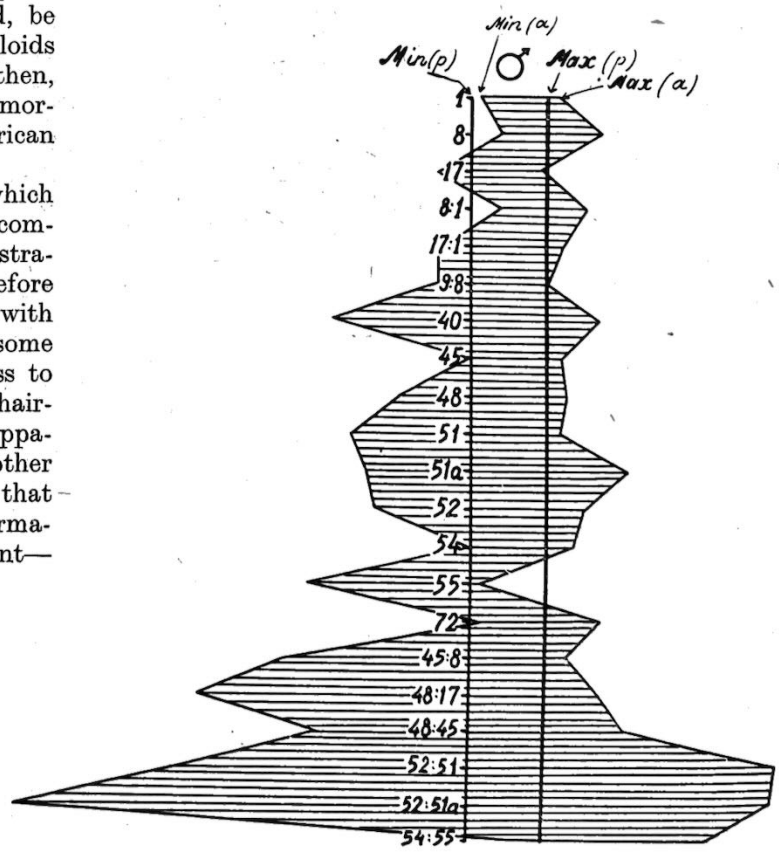


Fig. 8: Comparison of the inter-group variability of the Papuan and the African series. The intra-Papuan scale is taken as 100%. a = African nations, p = Papuans.

small races, as is usual in Soviet literature, or local races, as is usual in American literature, or posibly even otherwise. By this we understand the existence of a suprapopulational level of geographical divisions of Oceania.

After classifying the geographical groups of population, there arises the question of determining the taxonometrical distance between them, which is not solved using differential analysis according to single characters, if the taxonomical values would not be high. In current science there exists no standard means of determining such distances, but all suggested approaches are based on summary of characters. In a given case, determination of taxonomical difference with the help of the craniological scale will, of course, be involved, in other words the use of a summary of craniological characters.

A concrete approach was the use of the method often found in scientific papers, but especially widespread in geobotany (V. A. Vasiljevitch, 1969). The fundamental principle of the method is that the difference between two characters is calculated as one of the vectors in a multifactorial set of axes, in a multifactorial space of characters. This approach has the advantage that the multifactorial space can be identified with the taxonomical one. The distance between groups is determined according to a formula which is elementary in analytical geometry.

$$Dx^m y^m = \sqrt{(x_1 - y_1)^2 + (x_2 - y_2)^2 \ldots + (x_m - y_m)^2}$$

D — distance between groups, i.e. taxonomical distance

x^m and y^m — the summaries compared, with the final no. of characters

$x_1 \cdot 2 \ldots m$ — the characters of one summary

$y_1 \cdot 2 \ldots m$ — the characters of the other summary.

In *tab. 13* is given the metrical information used to determine the taxonomical distances between groups of populations. These are the inter-group mean values found in summarizing the data according to individual populations. The Tasmanians are an exception, being represented by one series of skulls only. The taxonomical distance is usually calculated separatly for male and female groups.

The results of the calculation are as follows:

Papuans — Australians	(male)	12.194
Papuans — Tasmanians	(male)	15.406
Papuans — Polynesians	(male)	17.613
Australians — Tasmanians	(male)	17.286
Australians — Polynesians	(male)	19.493
Tasmanians — Polynesians	(male)	23.969
Papuans — Australians	(female)	10.482
Papuans — Polynesians	(female)	17.254
Australians — Polynesians	(female)	20.248

The varied mutual differences between the groups compared can clearly be seen. The Papuans are closest to Australians, the Tasmanians are quite distant from Papuans, as from the Australians; the Polynesians, as was to be expected, have a completely outside position. This refers, however, to phenodistance, or distance according to phenotype (*tab. 13*). For the determination of genodistance, even only in the first approximation, it would be essential to introduce a formula for the correction of variability of characters and their mutual correlation. The result would in any case be only hypothetical, as a result of the small number of characters, and especially as a result of the complete absence of palaeoanthropological material from Oceania, and the impossibility, therefore, of judging the time of the differentiation between groups. As far as their individual position, and considerable mutual taxonomical distance are concerned, these are clearly demonstrated in the calculations given.

II. THE CRANIOLOGICAL TYPE OF INDONESIANS

HISTORY OF THE RESEARCH

Enough publications have been devoted to the craniology of the inhabitants of Iodonesia but it is not necessary to mention all of them, because they lost significance after the publication of the extensive information of G. Bonin (1931). Bonin's publication contains an exhaustive bibliography of all earlier research, and above all he published extensive and carefully described craniological material of the basic ethnic groups of the Sundas and Phillipine islands, measured according to a detailed programme. G. Bonin published material on six ethnical groups—the Dajaks of Kalimantan, the Sunds and the Javans of Java, the Madurs, the Tagals and the Aetas from the Phillipine Islands. At the same time as the work of Bonin there appeared an article by J. Yokoh, in which a small amount of craniological material from Kalimantan and Java was described (J. Yokoh, 1921). His information has an independent significance, and can be joined with that of Bonin on the Dajaks of Kalimantan and the Javans of Java.

Futher important development of the research on the craniology of the people of South-East Asia was made in the basic work of N. N. Čeboksarov (N. N. Čeboksarov, 1947). He compiled an exhaustive summary of information, taken from anthropological literature, enriched it with his own original information, and especially used whatever information was available to clarify geographical variability on eastern Asian territory, including Indonesia, and to make a detailed classification of the racial types of South-East Asia. For the inhabitants of Indonesia he had at his disposal the same information as was studied also by the author of this paper, but it was summarized, evaluated and divided into two groups — in the western and the eastern parts of Malaya. For purposes of more detailed characterization, Čeboksarov used the material of Bonin.

Comparision of Inter-group mean values according to the individual ethnical groups of Oceania TABLE 13

Indication	Measurement	♂				♀		
		Papuans	Australians	Tasmanians	Polynesians	Papuans	Australians	Polynesians
1	cranial length	182.5	188.5	182.2	185.6	173.5	178.9	175.9
8	max. cranial breadth	130.6	131.5	136.0	139.0	127.1	127.6	136.2
17	basion-bregma height	133.2	133.9	130.9	140.0	128.7	128.1	136.6
8:1	cranial index	71.7	70.0	74.2	75.5	73.0	71.2	77.5
17:1	height-length index	73.3	71.8	71.3	75.3	74.3	71.7	76.8
9:8	transversal-frontal index	72.3	73.3	69.1	67.8	71.4	72.9	66.8
40	length of the facial base	102.7	105.1	102.5	104.0	98.3	100.5	99.0
45	bizygomatic breadth	129.1	135.1	131.0	135.6	120.4	124.6	126.2
48	upper facial height	66.6	69.3	62.5	71.3	63.0	64.6	65.3
51	orbital breadth from mf (left)	41.8	44.1	41.3*	42.0	40.0	42.4	40.7
51a	orbital breadth from d (left)	39.5	38.7	39.3	39.7	38.0	37.6	37.7
52	orbital height (left)	33.9	33.5	31.1	34.9	32.8	33.0	34.3
54	nasal breadth	26.2	27.4	27.8	26.1	25.1	25.9	24.6
55	nasal height	50.4	49.1	47.1	53.1	47.5	45.8	50.0
72	total facial angle	78.8	77.9	77.5**	84.5	78.9	76.6	82.0
48:8	horizontal faciocerebral index	98.9	102.4	96.3	96.8	95.2	97.7	93.0
48:17	vertical faciocereberal index	51.7	51.6	47.7	51.9	52.3	50.6	48.7
48:45	upper facial index	51.8	51.3	49.6	52.5	52.4	52.0	51.8
52:51	orbital index from mf (left)	81.0	76.8	75.3***	83.2	81.9	80.0	84.6
52:51a	orbital index from d (left)	84.7	85.6	79.4	87.2	86.6	87.8	89.1
54:55	nasal index	52.0	55.9	59.1	49.5	52.9	56.6	49.9

*) *Determined according to width from dacryon with the addition of 2 mm.*
**) *Approximately determined on the basis of the value of the facial progmahiism index. according to FOGT-FLOWER.*
***) *The index of mean values is calculated in order to get the same number of measurements as for other series.*

After the publication of these two important comprehensive studies on the craniology of South-East Asia, a further work, which might have concerned the whole territory of Indonesia together, was not forthcoming.

There was, however, a certain increase of material on individual ethnical groups. For example Chong-Hoang Yen published rather inextensive material on the craniology of Bugs (the measurements were taken from literature (Cong-Hoang Yen, 1959). His publication, however, contains results for male skull measurements only. After one year two authors, Teh-Maw-Yuan and Chian-Shin-Tseng gave their results of the measurements of a small craniological collection from Sumatra and the neighbouring islands (Teh-Maw Yuan, Chian-Shin-Tseng, 1960). Finally, if we remember also the book of E. Genet-Varcin on the craniological type of the negrittos of Luzon the list of publications of the original craniological material, coming from the islands of South-East-Asia will be exhausted. The work "Kraniometrie der Balga und anderer Phillipinen Insulaner", by Teh-Maw Yuan and Erl-Hsiung Chang, Quarterly Journal of Anthropology, vol. VII, N 3—4, Fukuota City, 1960, was not considered. It adds nothing to the extensive series published by G. Bonin and F. Genet-Varcin). In the preceding review, the three-volume monograph of I. Kleiweg de Zwaan (1914) has purposely been omitted. It contained a review of all previous descriptions of the craniological groups of the inhabitants of the island of Nias, and measurements of a further large skull series studied by Kleiweg de Zwaan. Unfortunately, as with the preceding publication on the craniology of the island of Nias, it is not divided according to sex, and cannot therefore be used for purposes of comparison.

ORIGIN AND TERRITORIAL CLASSIFICATION OF THE MATERIAL

Fundamental material on the craniology of the Sundas and Maluccas islands was studied in the Museum of Anthropology and Ethnology of the Academy of Sciences of the Soviet Union. It is collection no. 5491, containing about a hundred skulls. As has already been said, it was obtained from the Army Office in the Dutch East Indies in 1841. To this basic material have been added individual skulls preserved in the Faculty of Normal Anatomy of the Army Medical Academy (nos. 85, 778, 779). The sex of all skulls was determined according to the inventory and cranoscopically, the bones of the postcranial skeleton not being available. In questionable cases I consulted with V. V. Ginsburg, I. K. Hochman and B. V. Firnštejn (*tabs. 29—30*) keepers of the collection.

The geographical and ethnical classification of the material was made easier, because in the information given in the company invoices, which are provided for collection 5499 in the Museum of Anthropology and Ethnography, and for the collection of the Army Medical Academy, we can find references to the ethnical groups of the peoples to whom the skulls belonged. In agreement with this information, the groups of Javans, Bugs, Balians, Madurs and the so-called Alfurs were classified. The Javans are represented by five

Mean Values and Indices of Indonesian Skulls

TABLE 14

Indication	Measurement	♂		♀	
		n	$\bar{x}$	n	$\bar{x}$
1	cranial length	28	173.8	13	171.3
8	max. cranial breadth	28	139.1	13	137.7
17	basion-bregma height	28	135.1	13	135.2
20	auricular height	28	114.3	13	113.5
5	basicranial length	28	98.1	13	98.3
9	minimal frontal breadth	28	92.6	13	93.2
12	occipital breadth	27	107.0	12	104.3
	supraorbital arches (1—6 Maritn)	28	2.28	13	1.77
	processus mastoideus (1—3)	28	2.18	13	1.38
8:1	cranial index	28	80.4	13	80.5
17:1	height-length index	28	77.9	13	79.1
9:8	transversal-frontal index	28	66.7	13	67.8
9:12	fronto-occipital index	27	87.0	12	89.5
40	length of the facial base	28	100.7	13	96.8
45	bizygomatic breadth	28	134.2	13	128.8
48	upper facial height	28	69.0	13	66.0
51	orbital breadth from mf (left)	28	41.8	13	40.9
51a	orbital breadth from d (left)	28	39.0	13	38.2
52	orbital height (left)	28	33.0	13	32.9
54	nasal breadth	28	25.4	13	25.3
55	nasal height	28	52.6	13	51.0
DC	dacryal breadth	28	20.2	13	19.6
DS	dacryal height	28	9.8	13	9.9
SC	symotic breadth	28	7.3	13	8.4
SS	symotic height	28	2.7	13	3.2
32	frontal angle (ma-me)	27	87.4	13	87.5
	frontal angle (gl-me)	27	81.6	13	82.7
72	total facial angle	28	82.0	13	83.6
73	middle facial angle	28	84.3	13	85.5
74	alveolar angle	28	73.4	13	75.3
75/I	angle of nasal bones to facial profile	28	15.4	13	16.3
77	nasomalar angle (fm-n-fm)	28	144.0	13	142.4
	zygomaxillar angle (zm-ss-zm)	28	128.8	13	129.5
	depth of fossa canina (left. in mm.)	28	3.7	13	4.7
40:5	index of facial prognatism	28	102.5	13	98.5
45:8	horizontal faciocerebral index	28	96.4	13	93.6
48:17	vertical faciocerebral index	28	51.1	13	48.9
48:45	upper facial index	28	51.4	13	51.3
52:51	orbital index from mf (left)	28	79.1	13	80.8
52:51a	orbital index from d (left)	28	84.8	13	86.5
54:55	nasal index	28	49.3	13	49.7
DS:DC	dacryal index	28	49.2	13	50.4
SS:SC	symotic index	28	37.2	13	38.3
	index of the curve of the facial bones (U-Din-Lian)	28	23.9	13	25.0

male and two female skulls, the Bugs by four male and three female, the Madurs by three male and three female, the inhabitants of the island of Bali by five male and one female, and finally, the Alfurs by eleven male and four female skulls. The term Alfur has no ethnical significance because, as far as is known, in all ethnographical literature, the inhabitants of the Maluccas Islands as a whole were known thus, without regard to the real language differences. It would be better to get rid of this term (see Narody Vostotschnoi Asii, Moskva, 1966 pp. 591—592). It is, however, kept here, because, first of all, some skulls in the collections are identified as Alfur, without any more detailed mention of their ethnical group, and secondly, there are included in the series several skulls of the populations of Tidore and Amboin. The series as a whole is heterogenous, and represents the population of the Maluccas Islands without classification into groups speaking the ambono-timor, sula-bakon, and south chalmacher languages. All groups are small in size, but in view of the perfect material, they are still interesting to some extent.

GENERAL CRANIOLOGICAL CHARACTERISTIC

Measurements and shape of the brain-case:

In the series studied sexual dimorphism is very weakly expressed according to skull measurements (tab. 14). In spite of this, however, female skulls, according to the horizontal measurements, are somewhat smaller than the male ones, but the height is in no way different to the male. Their length is small, breadth and height being average. The breadth of the frontal bone in female skulls is larger than in the male. The frontal bone is narrow, its slant is very small;

a directly protruding forehead can apparently be considered to be a characteristic feature of the southern mongoloids only. The relief of the frontal bone and of the mastoids are weak, in the first case it corresponds with the vertical position of the forehead, because the relief of the frontal bone and the values of the angle of the slope of the forehead are mutually dependent, as is known from an indirect inter-group correlation.

The cranial index falls within the limits of brachycrany the height-length index is smaller than the cranial, which corresponds to the relation between the height and breadth of the brain-case. In this way the Indonesian series differs from the Oceanic ones. In keeping with the rather small horizontal and the small minimal frontal diameter the transversal frontal index is small.

Measurements and shape of the facial skeleton

The breadth and height of the face are medium. In this direction the Indonesian skulls are nearer to the Oceanic and European craniological variants than to the classical representatives of the northern branch of the mongoloid race. They also belong within the framework of variation of the neutral forms according to the horizontal and vertical facio-cerebral indices and to the upper facial index.

The structure of the nasal regions

The measurements of the nose are comparatively small, which corresponds to the facial measurements. The relation of the measurements gives a mesorrhinne nasal index. The projection of the nasal bones is very weak, and in this connection the Indonesians are closest to the variants of the mongoloid race with flat noses, as represented by the original inhabitants of Amur (G. F. Debec, 1951, V. P. Alexejev, 1964, 1965). It is interesting that sexual dimorphism in this character is also not expressed and the angle of projection of the nasal bones of the female skulls is even greater than that of the male. This also occurs in the of values of parameters characterizing the development the nasal roots, which are higher in the female series than in the male. The nasal root is on the whole lower, and makes the Indonesian series closest to the flat-nosed variants of Siberia. In the structure of the lower edge of the pyriform aperture a sharp edge is prevalent, but the percentage of skulls with fovssoi praenasalis is very high (17 out of 41, or 41.5 %). Skulls with sulcus praenasalis or with an infantile shape of the lower edge of the pyriform aperture were not found.

The vertical profilation of the facial skeleton

The index of projection of the facial skeleton exceeds 100 % in male skulls and is smaller in female. According to the total facial angle, it is apparent that the series as a whole is prognathic. The facial angle is higher than 80 %, which makes it possible to distinguish the Indonesian facial type from the Oceanian one but it is visibly smaller than in the classical mongoloids and even than in the southern european craniological series. The alveolar prognathism is promnent.

Horizontal profilation of the facial skeleton

According to the angle of horizontal profilation, the Indonesian skulls are more profiled than those of the northern mongoloids, but they have nevertheless considerably flatter faces than the European series. We suppose that these values of the nasomalar and the zygomaxillar angles represent the result of an intermixing of Oceanic elements in the Indonesian series, but such mixing would lead in the first place to a considerable decrease in the zygomaxillar angle, which is disproportionally large in comparison with the nasomalar angle. In reality this is not so. Thus it is probably not possible to speak of a mixing of profilated europeoid elements. The comparatively neutral profilation of the Indonesian series is not, therefore, a result of later mixing, but rather a sign that the facial flatness of the northern mongolids is a consequence of specialization, and that even they arose from a basis of neutral typological variants. I have in mind, of course, only this one character, i.e. the horizontal profilation of the face, and conclusions cannot be drawn as to the origin of the craniological type of the Indonesians as a whole. The depth of the canine fossa is not particularly great in male skulls, but on the other hand is quite marked in female.

GENERAL CHARACTERISTICS

The skulls are small, slightly brachycranial, medium high, gracile, with narrow and vaulted foreheads. The facial dimensions are medium; not even the values of the indices characterizing the ratio of face and skull measurements are in any way unusual. alveolar pognathism is considerable. Another character distinct from the equatorial type is the lack in this series of a strikingly wide nose, and the pyriform aperture is slightly narrow both with regard to absolute size and to the nasal index. The facial skeleton is strikingly flattened in the horizontal plane, and the canine fossae are comparatively underdeveloped. The nasal bones project only very slightly, the root of the nose is low. The morphological characteristics of the series studied are evidence of a special conjunction of characters, typical for the equatorial and mongoloid populations.

GEOGRAPHICAL VARIATION

A division of the whole series according to ethnical units shows significant territorial variation in the craniological type of Indonesians (*tab. 15*). These differences are, however, based on only a small number of observations, especially in the female group, so that we cannot consider them reliable.

The Alfurs (the series of male skulls of Alfurs is the only one in which there are more than ten skulls) have comparatively long heads, the ratio of the height and width of the cranium approaches 100 %; the zygomaxillar angle is smaller than in all the remaining groups. These are the only characters which show a similarity in the craniological type of Alfurs and Papuans. This conclusion is in accord with other

TABLE 15a

Indication	Measurement	♂				
		Javans	Bugs	Madurs	Inhabitants of Bali I.	Alfurs
1	cranial length	170.6 (5)	176.0 (4)	169.7 (3)	168.4 (5)	178.0 (11)
8	max. cranial breadth	144.8 (5)	137.8 (4)	142.7 (3)	139.2 (5)	136.0 (11)
12	basion-bregma height	135.0 (5)	136.0 (4)	138.0 (3)	134.8 (5)	134.2 (11)
20	auricular height	115.6 (5)	115.2 (4)	118.0 (3)	111.6 (5)	113.6 (11)
5	basicranial length	95.2 (5)	101.5 (4)	94.7 (3)	97.0 (5)	99.6 (11)
9	minimal frontal breadth	92.8 (5)	92.7 (4)	92.0 (3)	90.6 (5)	93.6 (11)
12	occipital breadth	106.4 (5)	110.0 (4)	105.0 (3)	105.2 (5)	107.5 (10)
	supraorbital arches (1—6 Martin)	2.00 (5)	2.25 (4)	2.33 (3)	3.00 (5)	1.91 (11)
	processus mastoideus (1—3)	1.80 (5)	2.50 (4)	2.67 (3)	2.20 (5)	2.09 (11)
8:1	cranial index	85.0 (5)	78.5 (4)	84.2 (3)	82.8 (5)	76.5 (11)
17:1	height-length index	79.2 (5)	77.4 (4)	81.4 (3)	80.2 (5)	75.5 (11)
9:8	transersal-frontal index	64.2 (5)	67.2 (4)	64.5 (3)	65.1 (5)	68.9 (11)
9:12	fronto-occipital index	87.4 (5)	84.6 (4)	87.6 (3)	86.4 (5)	86.9 (10)
40	length of the facial base	99.6 (5)	103.2 (4)	93.3 (3)	99.8 (5)	102.6 (11)
45	bizygomatic breadth	133.8 (5)	134.2 (4)	132.7 (3)	136.2 (5)	134.0 (11)
48	upper facial height	71.0 (5)	68.5 (4)	67.7 (3)	68.5 (5)	68.8 (11)
51	orbital breadth from mf (left)	41.6 (5)	41.9 (4)	40.5 (3)	41.7 (5)	42.2 (11)
51a	orbital breadth from d (left)	38.2 (5)	39.3 (4)	38.0 (3)	39.3 (5)	39.5 (11)
52	orbital height (left)	34.2 (5)	32.8 (4)	32.8 (3)	32.2 (5)	33.0 (11)
54	nasal breadth	26.2 (5)	26.8 (4)	25.3 (3)	24.0 (5)	25.2 (11)
55	nasal height	53.4 (5)	52.0 (4)	53.7 (3)	50.0 (5)	53.5 (11)
DC	dacryal breadth	22.2 (5)	20.0 (4)	19.3 (3)	18.8 (5)	20.3 (11)
DS	dacryal height	9.5 (5)	8.9 (4)	9.3 (3)	8.6 (5)	11.1 (11)
SC	symotic breadth	7.5 (5)	6.2 (4)	7.6 (3)	6.5 (5)	8.0 (11)
SS	symotic breadth	2.4 (5)	2.1 (4)	2.7 (3)	2.6 (5)	3.0 (11)
32	frontal angle (ma-me)	90.4 (5)	88.2 (4)	91.7 (3)	88.0 (4)	84.5 (11)
	frontal angle (gl-me)	84.6 (5)	82.2 (4)	86.3 (3)	80.7 (4)	79.0 (11)
72	total facial angle	82.4 (5)	83.5 (4)	83.7 (3)	80.6 (5)	81.4 (11)
73	middle facial angle	85.6 (5)	85.0 (4)	84.7 (3)	82.8 (5)	83.9 (11)
74	alveolar angle	71.4 (5)	78.2 (4)	79.0 (3)	73.6 (5)	70.8 (11)
75/I	angle of nasal bones to facial profile	12.8 (5)	15.5 (4)	19.3 (3)	15.8 (5)	15.4 (11)
77	nasomalar angle (fm-n-fm)	146.6 (5)	141.0 (4)	147.3 (3)	147.8 (5)	141.3 (11)
	zygomaxillar angle (zm-sszm)	130.4 (5)	129.8 (4)	129.3 (3)	131.8 (5)	126.2 (11)
	depth of fossa canina (left. in mm.)	2.8 (5)	3.5 (4)	4.2 (3)	3.0 (5)	4.4 (11)
40:5	index of facial prognatism	104.6 (5)	100.9 (4)	98.9 (3)	102.8 (5)	103.0 (11)
45:8	horizontal faciocerebral index	92.5 (5)	97.6 (4)	93.0 (3)	97.9 (5)	98.6 (11)
48:17	vertical faciocerebral index	52.6 (5)	50.4 (4)	49.1 (3)	51.1 (5)	51.1 (11)
48:45	upper facial index	53.0 (5)	51.0 (4)	51.1 (3)	50.5 (5)	51.4 (11)
52:51	orbital index from mf (left)	82.3 (5)	78.2 (4)	81.1 (3)	77.2 (5)	78.4 (11)
52:51a	orbital index from d (left)	89.6 (5)	83.4 (4)	86.5 (3)	81.9 (5)	83.9 (11)
54:55	nasal index	49.3 (5)	51.5 (4)	47.2 (3)	48.1 (5)	47.2 (11)
DS:DC	dacryal index	42.3 (5)	45.1 (4)	48.8 (3)	47.1 (5)	55.0 (11)
SS:DC	symotic index	30.9 (5)	33.8 (4)	36.7 (3)	43.2 (5)	38.8 (11)
	index of the curve of the facial bones (U-Din-Lian)	24.6 (5)	22.2 (4)	24.2 (3)	23.7 (5)	24.1 (11)

observations of the considerable Papuan influence in the Maluccas Islands. All remaining groups are very distinct among themselves, but the differences cannot bo easily clearly interprcted. The nasal bones project most strongly in the male Madur skulls; the female Madur skulls are not distinct from the other series in this respect. The nasal root is not higher in male Madur skulls than in other skulls, the profilation of the facial skeleton in the horizontal plane is no stronger, but on the contrary weaker. There is, therefore no reason for us to speak of a strengthening of Oceanic features in the morphology of the Madurs, the more so since even the prognathism in this series is expressed somewhat more weakly than in others. In the last case, Bugs are close to Madurs, also having quite strong horizontal profilation. According to the projection of the nasal bones and the root of the nose the skulls do not differ from the other groups, and do not therefore show a concentration of the distinct characters of the Oceanic populations (*tab. 15*).

For a general comparison of all groups according to certain characters, the method was used which is known in our literature. It is not the best, but widely distributed method of combined polygons (G. F. Debets, 1948, N. B. Ignatjev, 1959). From the comparison of the combinational polygons (the intervals are these: length 160—180 mm, breadth 130—150 mm, height 130—140 mm., cranial index 72.0—85.0, bizygomatic breadth 124—127 mm., upper facial height 62—

Indication	Measurement	♀				
		Javans	Bugs	Madurs	Inhabitants of Bali I.	Alfurs
1	cranial length	179.5 (2)	170.0 (3)	165.0 (3)	171.0 (1)	173.0 (4)
8	max. cranial breadth	133.5 (2)	138.3 (3)	137.7 (3)	131.0 (1)	141.0 (4)
17	basion-bregma height	138.0 (2)	136.7 (3)	133.7 (3)	134.0 (1)	134.2 (4)
20	auricular height	116.0 (2)	114.0 (3)	112.0 (3)	109.0 (1)	114.0 (4)
5	basicranial length	104.5 (2)	100.0 (3)	98.3 (3)	101.0 (1)	93.2 (4)
9	minimal frontal breadth	96.5 (2)	95.0 (3)	92.7 (3)	90.0 (1)	91.2 (4)
12	occipital breadth	105.5 (2)	102.5 (2)	101.0 (3)	99.0 (1)	108.5 (4)
	supraorbital arches (1—6 Martin)	2.50 (2)	1.33 (3)	2.00 (3)	2.00 (1)	1.50 (4)
	processus mastoideus (1—3)	2.00 (2)	2.00 (3)	1.00 (3)	1.00 (1)	1.00 (4)
8:1	cranial index	74.5 (2)	81.5 (3)	83.5 (3)	76.6 (1)	81.6 (4)
17:1	height-length index	77.1 (2)	80.4 (3)	81.1 (3)	78.4 (1)	77.7 (4)
9:8	transversal-frontal index	72.3 (2)	68.7 (3)	67.3 (3)	68.7 (1)	64.9 (4)
9:12	fronto-occipital index	91.5 (2)	93.6 (2)	91.8 (3)	90.9 (1)	84.2 (4)
40	length of the facial base	98.0 (2)	99.0 (3)	97.0 (3)	101.0 (1)	93.2 (4)
45	bizygomatic breadth	125.0 (2)	132.3 (3)	130.7 (3)	124.0 (1)	128.0 (4)
48	upper facial height	65.0 (2)	67.3 (3)	64.7 (3)	70.0 (1)	65.5 (4)
51	orbital breadth from mf (left)	42.2 (2)	42.0 (3)	41.3 (3)	40.0 (1)	39.2 (4)
51a	orbital breadth from d (left)	38.2 (2)	39.5 (3)	38.3 (3)	38.0 (1)	37.1 (4)
52	orbital height (left)	31.5 (2)	33.0 (3)	33.0 (3)	33.5 (1)	33.4 (4)
54	nasal breadth	25.0 (2)	25.7 (3)	25.0 (3)	24.0 (1)	25.7 (4)
55	nasal height	49.5 (2)	53.3 (3)	51.0 (3)	51.0 (1)	50.0 (4)
DC	dacryal breadth	21.4 (2)	19.7 (3)	19.4 (3)	16.7 (1)	19.4 (4)
DS	dacryal height	13.0 (2)	9.5 (3)	9.3 (3)	8.2 (1)	9.4 (4)
SC	symotic breadth	10.3 (2)	9.1 (3)	7.7 (3)	8.4 (1)	7.5 (4)
SS	symotic breadth	4.0 (2)	3.5 (3)	2.8 (3)	3.3 (1)	2.7 (4)
32	frontal angle (ma-me)	88.0 (2)	86.0 (3)	88.0 (3)	86.0 (1)	88.2 (4)
	frontal angle (gl-me)	81.5 (2)	83.0 (3)	82.0 (3)	82.0 (1)	83.5 (4)
72	total facial angle	89.5 (2)	83.0 (3)	82.0 (3)	82.0 (1)	82.8 (4)
73	middle facial angle	91.5 (2)	84.3 (3)	83.7 (3)	84.0 (1)	85.2 (4)
74	alveolar angle	81.0 (2)	76.3 (3)	74.0 (3)	75.0 (1)	72.8 (4)
75/I	angle of nasal bones to facial profils	21.0 (2)	14.0 (3)	15.3 (3)	15.0 (1)	16.8 (4)
77	nasomalar angle (fm-n-fm)	134.0 (2)	138.7 (3)	146.3 (3)	143.0 (1)	146.2 (4)
	zygomaxillar angle (zm-sszm)	131.0 (2)	125.0 (3)	132.3 (3)	128.0 (1)	130.5 (4)
	depth of fossa canina (left. in mm.)	3.7 (2)	4.8 (3)	4.7 (3)	3.0 (1)	5.6 (4)
40:5	index of facial prognatism	93.9 (2)	99.1 (3)	98.6 (3)	100.0 (1)	100.0 (4)
45:8	horizontal faciocerebral index	93.6 (2)	95.7 (3)	94.9 (3)	94.7 (1)	90.9 (4)
48:17	vertical faciocerebral index	47.1 (2)	49.3 (3)	48.4 (3)	52.2 (1)	48.9 (4)
48:45	upper facial index	52.0 (2)	50.9 (3)	49.6 (3)	56.5 (1)	51.2 (4)
52:51	orbital index from mf (left)	74.6 (2)	78.6 (3)	80.3 (3)	83.7 (1)	85.2 (4)
52:51a	orbital index from d (left)	82.4 (2)	83.5 (3)	86.7 (3)	88.2 (1)	90.2 (4)
54:55	nasal index	50.6 (2)	48.2 (3)	49.0 (3)	47.1 (1)	51.6 (4)
DS:DC	dacryal index	60.5 (2)	48.5 (3)	48.8 (3)	49.1 (1)	48.2 (4)
SS:DC	symotic index	40.2 (2)	39.2 (3)	36.3 (3)	39.3 (1)	37.8 (4)
	index of the curve of the facial bones (U-Din-Lian)	22.2 (2)	23.2 (3)	24.7 (3)	27.2 (1)	27.4 (4)

75 mm,, upper facial index 49.0—59.0, vertical craniofacial index 47.0—57.0, angle of the nasal bone to the profile line 11—21°, nasomalar angle 134—150°, orbital index from the maxillo-frontale 72.0—88.0, nasal index 47.0—52.0) of various groups, it is apparent that the differences between them do not have an equivocal character; the polygons of male and female skulls from the same groups are not particularly similar to each other and various characters, vary in inter-group comparison independently of each other (*fig. 9*). The small number of series compared prevents, therefore, the discovery of any real morphological differences between them.

SUMMARIZED INFORMATION ON THE CRANIOLOGY OF INDONESIANS

In view of the small number of observations in each of the series studied, my information is summarized with that previously published. Thus I found eight groups, of which each represents an independent ethnical unit (*tab. 16*). Their geographical position is given on the map (*fig. 10*). Information on male skulls is used, partly because it is more extensive, partly because it is dealt with more in the literature (*tab. 16*).

1. 1. Sundas Islanders. The skulls come from the extreme norhwest of Java. They are described by G. Bonin.

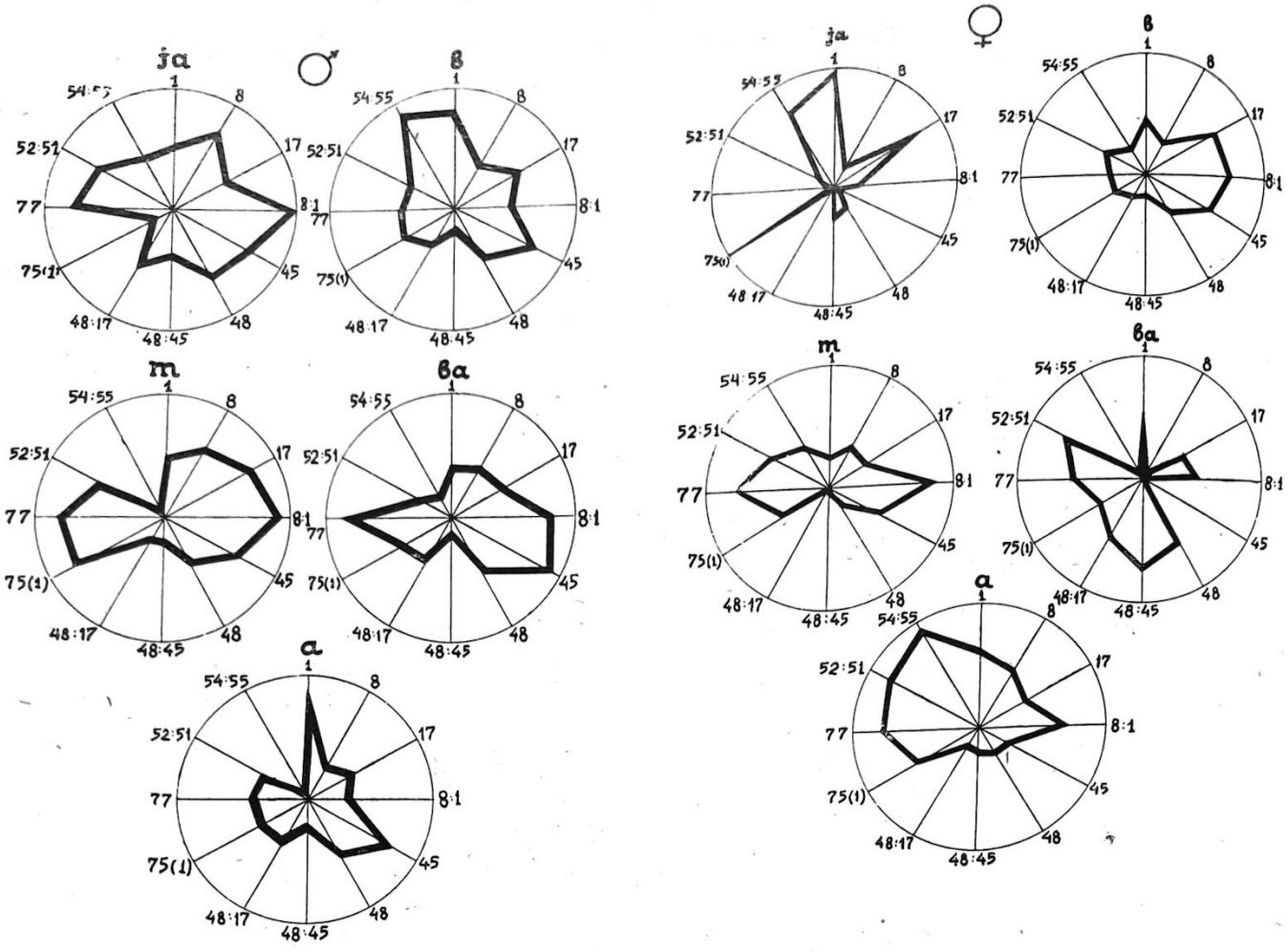


Fig. 9: The combinational polygons of the Indonesian series. a = Alfurs, b = Bugs, ba = Balians, ja = Javans, m = Madurs.

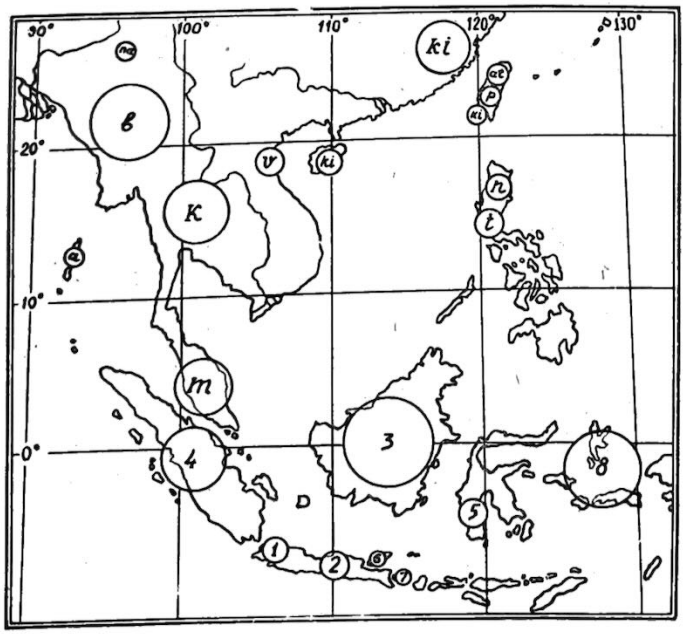


Fig. 10: Distribution of the Indonesian series described and of the series from south-East Asia. The size of the circles corresponds approximately to that of the territories where the appropiate craniological material was collected. The Indonesian series are indicated by Arabic nos.: a = Andamanese, at = Atajals, b = the inhabitants of Burma, k = = Khontai, ki = southern Chinese, m = Malayans, n = = the negrittos of Luzon, na = Naga, p = Pin Pu, t = = Tagals, v = Vietnamese.

Position of the described Indonesian and South-east Asian series. The dimensions of the circles approximately correspond to the size of the territories, where the respective craniological material was collected. The Indonesian series is marked with Arabic figures,
a — Andaman Islanders, at — Atavalians, b — Burmans, k — Khontais, ki — South Chinese, m — Malays, n — Negritos from Luzon, na — Nagas, p — Pinpus, t — Tagals, v — Vietnamese

1. Sundas
2. Javanese
3. Dayaks
4. Battaks
5. Bugs
6. Maduras
7. Bali Islanders
8. Alfuros

TABLE 16

Indication	Measurements	Sundans	Javans	Dajaks	Battaks	Bugs	Madurs	Inhabitants of Bali Ins.	Alfurs
1	cranial length	169.9 (55)	173.7 (80)	176.5 (47)	176.6 (8)	175.9 (13)	171.8 (18)	168.4 (5)	178.0 (11)
8	max. cranial breadth	140.8 (54)	142.1 (80)	138.0 (65)	144.6 (8)	138.4 (21)	143.0 (18)	139.2 (5)	136.0 (11)
17	basion-bregma height	134.4 (55)	135.6 (77)	135.4 (59)	138.0 (8)	135.1 (13)	136.6 (18)	134.8 (5)	134.2 (11)
8:1	cranial index	83.0 (54)	81.8 (80)	78.3 (65)	81.9 (8)	79.1 (13)	83.4 (18)	82.8 (5)	76.5 (11)
17:1	height-length index	79.2 (55)	78.2 (77)	76.9 (59)	78.2 (8)	77.1 (12)	79.5 (18)	80.2 (5)	75.5 (11)
9:8	transversal-frontal index	64.5*	65.2*	67.7*	64.1 (8)	65.7 (21)	64.1*	65.1 (5)	68.9 (11)
40	length of the facial base	97.7 (50)**	98.9 (70)**	96.9 (42)**	—	103.2 (4)	93.3 (3)	99.8 (5)	102.6 (11)
45	bizygomatic breadth	132.0 (52)	134.7 (80)	133.1 (64)	136.0 (8)	132.8 (20)	134.2 (18)	136.2 (5)	134.0 (11)
48	upper facial height	69.8 (50)	70.6 (80)	69.1 (57)	70.0 (5)	67.1 (12)	69.4 (17)	68.5 (5)	68.8 (11)
51	orbital breadth from mf (left)	41.8 (55)	42.2 (70)	42.0 (40)	40.1 (8)	40.0 (21)	41.9 (18)	41.7 (5)	42.2 (11)
51a	orbital breadth from d (left)	38.5 (46)	38.7 (52)	39.4 (36)	—	39.3 (4)	38.0 (3)	39.3 (5)	39.5 (11)
52	orbital height (left)	33.8 (55)	34.2 (70)	33.7 (39)	35.2 (8)	33.0 (21)	33.0 (18)	32.2 (5)	33.0 (11)
54	nasal breadth	26.3 (54)	26.8 (70)	27.2 (50)	26.2 (8)	26.2 (21)	26.5 (18)	24.0 (5)	25.2 (11)
55	nasal height	49.3 (54)	50.8 (70)	50.2 (39)	53.8 (5)	49.5 (13)	52.1 (18)	50.0 (5)	53.5 (11)
72	total facial angle	81.1 (51)	81.8 (76)	82.8 (43)	84.0 (4)	82.8 (17)	83.3 (16)	80.6 (5)	81.4 (11)
45:8	horizontal faciocerebral index	93.7*	94.8*	96.4*	94.1 (8)	95.9 (20)	93.8*	97.9 (5)	98.6 (11)
48:17	vertical faciocerebral index	51.9*	51.1*	51.0*	51.5*	49.7*	50.8*	51.1 (5)	51.1 (11)
48:45	upper facial index	52.9*	52.4*	51.9*	53.7 (5)	50.5*	51.7*	50.5 (5)	51.4 (11)
52:51	orbital index from mf (left)	80.9 (55)	81.2 (80)	81.1 (49)	88.0 (8)	83.1 (21)	78.7 (18)	77.2 (5)	78.4 (11)
52:51a	orbital index from d (left)	87.8*	88.4*	85.5*	—	83.4 (4)	86.5 (3)	81.9 (5)	83.9 (11)
54:55	nasal index	53.5 (53)	52.6 (80)	54.7 (51)	47.7 (8)	52.4 (13)	51.0 (18)	48.1 (5)	47.2 (11)

*) *Index of mean values.*

**) *With G. Shima's correction.*

2. Javans. A summarized series, compiled from the information of G. Bonin, J. Yokoh and myself.

3. Dajaks. A basic, inextensive series of skulls of Dajaks from Kalimantan, described by G. Bonin. Not numerous material of J. Yokoh has been added to it.

4. Battaks. This series can be only tentatively described as Battakan. In the series of skulls described by Teh-Maw-Juan and Chian-Shin Tseng, only five belonged to Battaks. A further three represent the other ethnical groups of the island. This is, therefore, more a series of skulls of the inhabitants of Sumatra as a whole than a Battakian series, which must be borne in mind in further comparisons.

5. Bugs. Summarized information from Chong-Huan Jeng and myself.

6. Madurs. Summarized information from G. Bonin and myself.

7. The inhabitants of Bali Island. The results of my measurements, taken from the preceding table.

8. Alfurs. My information. It is necessary to bear in mind the same considerations as given above regarding the origin of this series.

Even in the summarized comparison, it can be seen that the compiled series from the Maluccas Islands has a special position. Among other groups, they differ in dolichocrany and in a minimal difference between the value of the cranial and of the height-length indices. The comparatively narrow face remains, however, incomprehensible. Among the remaining series compared, the greatest differences are in the cranial and nasal indices, and among the absolute measurements, the difference in upper facial breadth and the total facial angle.

The geographical position, however, is not always in accord with the morphological types characterizing it. So, for example, on Java and the adjacent islands, wide-faced types are represented just as much as narrow-faced ones. Among the geographically close inhabitants of the islands of Bali and Madura, there is a substantial difference in the degree of prognathism. On the other hand, according to the same character, the Maduran series is similar to the skulls of the inhabitants of Sumatra. All these cases of morphological similarity occur without regard to geographical area, which is evidence of the complexity of the process which took place at the origin of racial types in the region observed, and of the fact that this process did not fully respected the typological lines. At the present time, indeed, individual islands are divided by great stretches of sea and even by seas, but at the time of the settlement of the islands, they were joined by corridors of land, which assisted in the formation of occurrence of local variability. As is natural, this was helped by the intensive mixing of not two, but several, racial and linguistic groups. In connection

with these theories, I cannot leave out the question of the real existence of local anthropological types in the inhabitants of Indonesia. These are classified in most detail and with most care by N. N. Cheboksarov (1964). He also wrote a detailed history in connection with the processes of the formation of racial types in the neighbouring areas, and in connection with ethnogenetical problems (N. N. Cheboksarov, 1966; M. G. Levin, N. N. Cheboksarov, 1951). On the basis of variations of the cranial index he separates two groups; the Kalimantan, with a longer head, corresponding to the Indonesian race of other authors, and a group with a short head, the Tan-Malayan (according to Malayan race in other classifications). I have already made reference above to the fact that these two groups do not form coherent geographical areas. It is therefore possible to classify them only with reserve, keeping in mind all the time that the level of differentiation of these types is not striking, and that it occurs in one or two characters only. Racial geography calls here to mind a fact which we meet in the context of the spread of the Russian people, where the southern group strongly differs from the northern group only in pigmentation, while in the remaining characters many transient variations appear (V. P. Alexejev, 1969). As is known, the Indonesian race, classified first by I. E. Deniken, is often considered to be a special branch of the europeoid racial stock (G. Montandon, 1928). Besides the clash of this view with the geographical one, europeoid type of this branch is not confirmed even in the morphology; the Indonesians differ craniologically from the europeoids in a flattening of the facial skeleton, a weakly prominent and wider nose, and prognathism. In this context the craniological material corresponds completely with the somatological data previously published (N. N. Cheboksarov, 1947; C. Coon, 1965).

ON THE ORIGIN OF THE CRANIOLOGICAL CHARACTERS OF INDONESIANS

The basic question of the origin of racial groups with regard to the formation and anthropological structure of the inhabitants of Indonesia, is the problem of mixed, or, on the contrary, undifferentiated origin of the characteristic complex of characters of these people. It is clear that the Indonesians differ from the classical mongoloids in numerous characters—we have seen ample evidence of this in observing their craniological type as a whole; they are strongly prognathic and have wide noses, which makes them comparable with tropical types. From somatological research we know that they differ from the tropical types by their much lighter skin colour, straighter hair, and mongoloid characteristics in the structure of the ocular regions. The fact that Indonesians lie between mongoloids and tropical types is, therefore, beyond doubt. This conclusion does not, however, in itself solve the question with which we began this section.

Does the existing craniological material answer to the hypothesis of metisation? In mixed populations the degree of emphasis of the morphological characters of the initial groups directly corresponds to their proportion of involvement in the mixing (I. Trevor, 1953).

(This of course deals with polymorphic characters of mixed heritability. The statement does not, naturally, concern alternative characters with dominant-recessive type of heritability or with incomplete dominance). If, therefore, the anthropological structure of the Indonesians was really formed as a consequence of the mixing of tropical and mongoloid types, expressed in approximately the same percentage, the Indonesians must be less prognathic and have wider noses than the representatives of the Oceanic group of tropical populations, who have less flat faces and are less mongoloids in the structure of the ocular regions than the northern mongoloids and must have softer and more wavy hair than the inhabitants of northern Asia. A comparison according to characters important for the raciogenetical relation, made by N. N. Cheboksarov, shows that we meet with epicanthus in Indonesia comparatively rarely compared with the original inhabitants of Siberia. Hard straight hair is a character equally of Siberian mongoloids and of the inhabitants of Indonesia. A comparison of the flatness of the face according to somatological characters is not possible; the Indonesians are more similar craniologically in both the angles of horizontal profilation not to mongoloids, but rather to the representatives of the inter-group populations—the Ural and the south Siberian population. In any one case this intermediate position could be a result of the mixing of equatorial types, even if the steady decrease of both angles does not particularly support this a priori supposition: the zygomaxillar angle would have had to decrease faster than the nasomalar, and the index given by V. P. Yakimov (1960), expressing the percent ratio of the value of the zygomaxillar angle to that of the nasomalar, would have to have been smaller than in the Indonesian series. On the other hand, the exphasis of the prognathism of the Indonesians as a whole is smaller than with the Papuans and Melanesians, whereas they do not differ practically from the Papuans according to nasal breadth. This holds for both the absolute and the relative breadth of the nose. Into the group of characters proper to Indonesians fall, therefore, both the morphological features whose origin can easily be clarified by a mixing of mongoloid and tropical forms (degree of prognathism, percentage occurrence of epicanthus, partial profilation of the face in the horizontal plane), and also the characters with marginal variation (hard straight hair, broad nose). The general conclusion of all that has been said is aparent. During the formation of the anthropological structure of the inhabitants of Indonesia, there took place not only a mixing but also a conservation of an undifferentiated group of characters. The craniological material does not, however, for the time being give us a basis for showing which of these two moments played a greater role in the origin of these two groups.

Average Measurements and Cranial Indices of the Inhabitants of the Phillipine Ins. ♂♂ TABLE 17

Indication	Measurement	Tagals		Negrittos	
		n	$\bar{x}$	n	$\bar{x}$
1	cranial length	31	179.2	48	170.1
8	max. cranial breadth	31	138.9	48	141.5
17	basion-bregma height	26	137.2	44	133.5
8:1	cranial index	31	77.5	48	83.2
17:1	height-length index	26	76.9	44	78.4
9:8	transversal-frontal index	—	67.9*	—	64.9*
40	length of the facial base	22	97.9**	26	95.6**
45	bizygomatic breadth	23	131.7	45	130.7
48	upper facial height	26	70.0	35	69.1***
51	orbital breadth from mf (left)	29	42.8	47	41.3
51a	orbital breadth from d (left)	16	39.6	26	39.5
52	orbital height (left)	28	33.6	47	33.2
54	nasal breadth	25	27.7	46	26.7
55	nasal height	26	50.0	45	48.7
72	total facial angle	22	84.2	30	84.4
45:8	horizontal faciocerebral index	—	94.8*	—	99.4*
48:17	vertical faciocerebral index	—	51.0*	—	51.8*
48:45	upper facial index	—	53.2*	—	52.9*
52:51	orbital index from mf (left)	28	78.7	—	80.4*
52:51a	orbital index from d (left)	—	84.8*	—	84.1*
54:55	nasal index	24	55.5	45	55.0

*) *Index of mean values.*
**) *Corrected using G. Shima's amendment.*
***) *E. Genet-Varcin measured to the prosthion. Her resuets were corrected before sumarization with G. Bonin's data according to the ratio 1 : 1.035. See: V. P. Alexejev, G. F. Debec: Kraniometria. Metodika antropologičeskich issledovanij. Moskva 1964, pp. 57.*

INDONESIANS AND THE INHABITANTS OF THE PHILLIPINES

The variability of the ethnical structure of the Phillipine Islands is only slightly evident in the craniological material. G. Bonin published material concerning two ethnical groups—the Tagals and the Aetas. In the series of negritto skulls described by E. Genet-Varcin the ehtnical appurtenance cannot be exactly determined. It apparently belongs to the Aetas because the skulls come from the island of Luzon, and there are no other negritto groups there. Nonetheless, since there are no plain pointers, I called the series compiled from the summarized data of G. Bonin and E. Genet-Varcin by the broad term "negritto". This term, of Spanish origin, has no ethnical significance, but it is convenient and traditional. The Aetas apparently formed the predominent group which left this series (*tab. 17*).

A combination of orthognath facial skeleton with wide nose calls attention to itself in both the Phillipine series. According to the size of the overall angle of the facial profile of Tagal and negritto skulls, they are similar to europeoids and to the northern Mongolian series; as far as nasal breadth is concerned, it is not greater than in Melanesian skulls. It is necessary to remember that among the inhabitants of Melanesia there exists an orthognath group (Caniet Island), that Papuan skulls also differ in this character, and that Ainu skulls, where the influence of an Oceanic element is generally recognized, differ little in the angle of the facial profile from other craniological series of northern and eastern Asia (M. G. Levin, 1958). If all these observations are correct, it is apparently necessary to suppose that this craniological group in the structure of the Melanesian groups of populations, which was characterized by an orthognath or comparatively orthognath facial skeleton, also formed one of the elements in the formation of the anthropological type of the inhabitants of the Phillipines. On the basis of somatological observations, an idea of a mixing of negroid and south Mongoloid elements was formed (*tab. 17*). The craniological research completely confirms this conclusion. The spread of some sort of anthropological complex from Melanesia, first of all to the Phillipines and then northwards to the Japanese islands also already appears credible from the geographical standpoint. In order to adopt this point of view, however, it is essential to change our idea of the taxonomical position and of the origin of the orthognath variant in the structure of the Melanesians. We had thought that this variant was apparent in one population, or to be more exact in one island group of populations. It was definitely more widespread, even in early times. The orthognathism of this type in comparison with the other anthropological complexes of Oceania leads to the hypothesis according to which this type is distinct in its great neutrality, and keeps the characters of the protomorphic type. If we consider the effect of

TABLE 18

Average Measurements and Indices of Andamanese Skulls

Indication	Measurement	♂		♀	
		n	$\bar{x}$	n	$\bar{x}$
1	cranial length	54	167.2	40	161.4
8	max. cranial breadth	55	135.6	40	132.1
17	basion-bregma height	54	128.9	40	124.4
8:1	cranial index	54	81.1	40	81.6
17:1	height-length index	53	77.1	39	77.1
9:8	transversal-frontal index	—	68.0*	—	68.2*
40	length of the facial base	52	93.2	38	91.6
45	bizygomatic breadth	54	123.3	40	118.0
48	upper facial height	54	62.7	39	59.2
51	orbital breadth from mf (left)	22	40.1	—	—
51a	orbital breadth from d (left)	55	37.1	38	36.5
52	orbital height (left)	55	32.8	38	32.2
54	nasal breadth	55	23.8	40	22.7
55	nasal height	50	45.6	40	42.5
72	total facial angle	20	81.8	—	—
45:8	horizontal faciocerebral index	—	90.9*	—	89.3*
48:17	vertical faciocerebral index	—	48.6*	—	47.6*
48:45	upper facial index	53	50.7	39	49.9
52:51	orbital index from mf (left)	20	83.1	—	—
52:51a	orbital index from d (left)	55	88.8	38	88.4
54:55	nasal index	48	51.1	38	52.5

*) *Index of mean values.*

adaptation in the formation of the anthropological characters of the Melanesian populations, it is essential to state that this neutrality was a property of the initial groups. With them this morphology neutrality apparently spread to the north. The greater robusticity of the inhabitants of the Phillipines in comparison with the Melanesians of Caniet Island prooves the preservation of the protomorphic type in Phillipine in greater extent than in Melanesians, for all the adaptive processes could have taken place more slowly to the north.

The small craniological differences between Tagals and Aetas represent a special problem. In comparing the material of G. Bonin and E. Genet-Varcin the difference between them is quite obvious, but decreases sharply in a comparison of the summarized material, and even more when comparing the material of G. Bonin alone. Is it possible that a large number of non-Aetian skulls got into the Aetian series of G. Bonin? Basically, if we consider the difficulties in obtaining skulls of negrittos as a consequence of the isolation and inaccessiblity of many regions where negrittos live, this supposition has some weight, although it is confirmed in no other way than by the morphology. On the other hand, the known somatological expressiveness of negrittos from Iuzon is beyond doubt, as also the justification of their position as an independent group in most classifications. It is not the only reason for classifying the race of negrittos as one unit. In any case the striking similarity of Tagals and Aetas shows that the characteristic morphological type of Aetas could have been formed even on a Tagalian morphological basis. To put it another way, the adaptive process led to an independent formation of similar complexes of characters in Semangs from Malakka, Aetas from the Phillipines and Onges from the Andaman Islands. Thus we apply to the negrittos of South-East Asia the basic supposition of the hypothesis of M. G. Levin on the independent origin of African and Asian Pygmy forms (M. G. Levin, 1946)—a hypothesis which is at present spreading even in other countries (I. Schwidetski, 1962). In contrast, it would be difficult to unterstand why, if similar processes of adaptation could lead to the occurrence of phenotypically very similar, even if genetically not related, combinations of characters, in Asia and on the islands of South-East Asia, why could not an independent ocurrence of similar complexes on each island be the result of similar adaptation?

INDONESIANS AND ANDAMANS

The craniological material obtained on the Andaman Islands has been described more than once. A heterogenous series whose mean values were compiled from the measurements made by various authors was published by G. Morant (1924). It is not very extensive, and individual characters are given in it with a various numbers of measurements. G. Bonin published much more extensive material, but this material is overshadowed in its significance by the new rpape of M. Cappieri, which contains a description of the most numerous series of Andaman skulls of all published works (M. Cappieri, 1964). Unfortunately it is not possible to summarize his information together with that of G. Bonin and G. Morant, because he studied the craniology of Andamanese in various museums, the list of which was not published, and it is therefore possible that skulls already measured by other authors are included. The information of Cap-

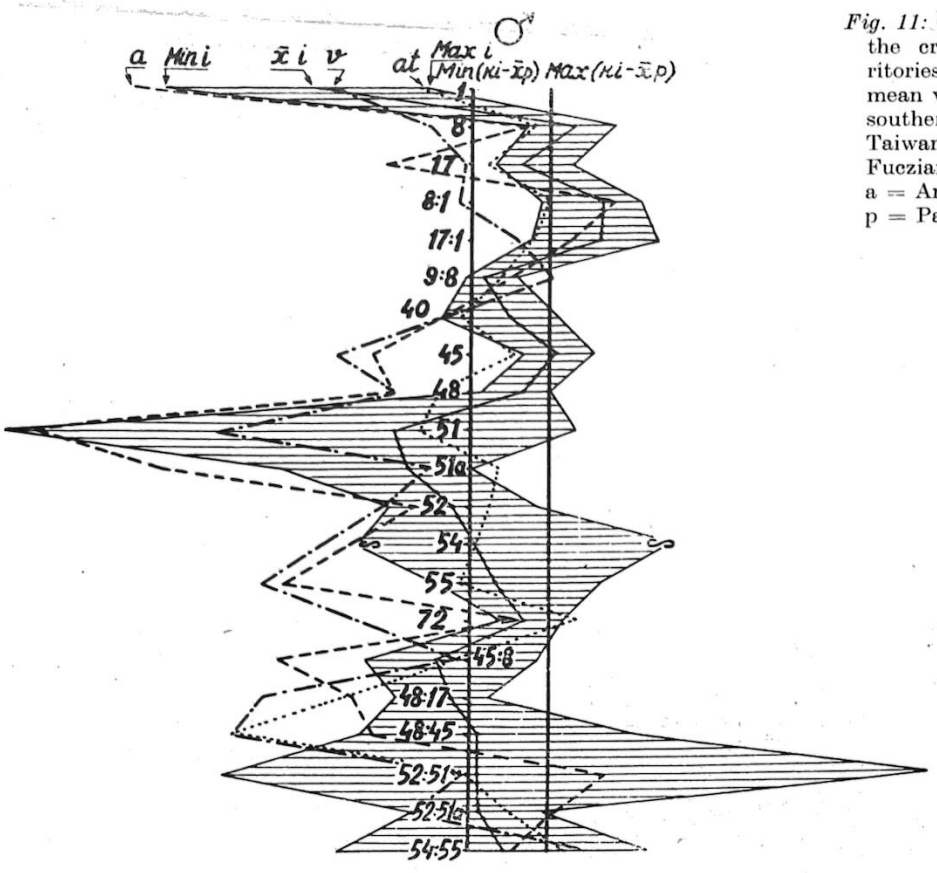


Fig. 11: Comparison of the Indonesian series with the craniological series of the surrounding territories. The distance between the Papuans (the mean values from all the Papuan series) and the southern Chinese (the skulls from the island of Taiwan. For the ratio 48 : 17 the value of the Fuczian series was taken) is taken as 100%. a = Andamanese, at = Atajals, i = Indonesians, p = Papuans, v = Veddas.

pieri is also given in a table (*tab. 18*). An exception is formed by the value of the orbital breadth from the maxillofrontale, the corresponding index and the total facial angle which were taken from the work of G. Bonin.

Andamanese differ from all Indonesian series in exceptionally small cranial and facial dimensions. Incidentally, Andaman skulls are substantially smaller than those of the negrittos of Luzon, which serves as an additional argument against the hypothesis of the genetical relationship of all Asiatic negrittos (*tab. 18*). In comparison with Aetas the Onges have a wider nose both absolutely and relatively, but are also more prognathic. We have, therefore, at our disposal a complex of differences according to important craniological characters, which supports the idea that there does not exist a direct genetical connection between them. The Andamanese, however, differ in the same characters from Tagals, i.e. in the relative prognathism of the facial skeleton connected with a comparatively narrow nose. This complex of characters, gracile, small skulls, a relatively narrow nose and prognathism of the facial skeleton, leads to the question of the independent position of Andamans in racial systematics and in comparison with Indonesians (*fig. 11*). The origin of this complex of characters is not clearer and it is difficult to say which racial variant formed the basis of the anthropological complex of the Andamanese. In any case it is not possible to solve this question on the craniological material by the method which has been partly described. If we consider the phenomenon of gracialization, then we can compare the Andamanese as a gracialized population very easily with the Sundans or the Javans, especially with the former. In such a comparison, of course, the somatological information shows substantial differences in skin colour, in hair structure and in the shape of the ocular regions. Gracialization creates for us a theoretically acceptable hypothesis, but such a one which is not proved in this particular case. In the end, therefore, we come to the conclusion that the Indonesians and the Andamanese are not mutually closely related. The latter were formed on the basis of some group of populations of a tropical people, but it is today impossible to name this group concretely.

INDONESIANS AND VEDDAS

The anthropological individuality of the Veddas in Ceylon was long ago noted by researchers. Rather than decide the problem as a whole, we shall confine ourselves to the craniological information.

Many anthropologists have measured Vedda skulls. G. Morant compiled a review of previous measurements in his work which contained the first attempt to classify Asiatic races according to craniological characters (G. Morant, 1924). He later published a more complete review in cooperation with U Din-Luan (Woo, G. Morant, 1932). Like all works of this type, however, based on literary information, it has one shortcoming, that various characters are given in the total series with various numbers of observa-

Average Measurements and Indices of Vedda Skulls

TABLE 19

Indication	Measurement	♂		♀	
		n	$\bar{x}$	n	$\bar{x}$
1	cranial length	44	174.5	22	171.0
8	max. cranial breadth	47	126.1	22	123.9
17	basion-bregma height	44	133.0	20	128.7
8:1	cranial index	44	70.9	22	72.7
17:1	height-length index	44	74.5	20	74.7
9:8	frontal-transversal index	45	72.4	21	72.3
40	length of the facial base	40	93.3	18	88.7
45	bizygomatic breadth	44	121.2	19	116.3
48	upper facial height	40	61.4*	19	58.4*
51	orbital breadth from mf (left)	18	40.8	—	—
51a	orbital breadth from d (left)	43	39.2	18	37.0
52	orbital height (left)	43	32.1	18	31.5
54	nasal breadth	47	24.2	18	23.2
55	nasal height	23	45.0	—	—
72	total facial angle	—	96.1**	—	93.9**
45:8	horizontal faciocerebral index	—	46.2**	—	45.4**
48:17	vertical faciocerebral index	40	49.0	19	48.9
48:45	upper facial index	—	80.9**	—	—
52:51	orbital index from mf (left)	—	81.9**	—	85.1**
52:51a	orbital index from d (left)	23	52.9	—	—
54:55	nasal index				

*) *1.5 mm added to upper facial height from prostion*

**) *Index of mean values*

tions. Basides, measurements of male skulls only were summarized. I used this review only for separate measurements. In total I used the mean values (tab. 19) obtained on the basis of individual measurements and contained in the very extensive monograph of W. Osman-Hill (1941). He studied the skulls of Veddas in many museums of Europe, Asia and even Australia, and as a result, his measurements are substantially more complete than those of any other researcher. Unfortunately, his date cannot be combined with the information from the review of U Din-Lian and Morant, because this review contains skulls which Osman-Hill later studied again. In the calculation of mean values a female skull from the Army Medical Academy (no. 870) was added (*tab. 19*). Veddas, as well as having exceptionally small dimensions of the facial skeleton (the measurements are even smaller than those of Andamanese) are sharply dolichocranial and are distinct in their cranial structure in having a height greater than the breadth. Among other peculiarities, it is necessary to note the relatively wide forehead and comparatively narrow nose for a southern population. Unfortunately, there exists no information on the total facial angle, and it is therefore impossible to consider the degree of prognathism. Even without this information, however, it is apparent that the Veddas differ substantially from Indonesians craniologically and are similar to Andamanese (*fig. 11*). This widens the factual basis for a consideration of the problem of the origin of Andamans, which remained open in the preceding section. It is possible to suppose that certain groups of protomorphic australoids with wavy hair (we understand by this term the original undifferentiated form of the negroid-europeoid people) were on the one hand the initial groups leading to Veddas (who apparently underwent gracialization), and on the other hand the basis of the formation of Andaman islanders. Racial formation took place in this region, so it seems, in two stages—first gracilization (Veddas) then brachycephalization (Onges). It is important to bear in mind that the adaptive processes were apparent in a different way in Ceylon and on the Andaman Islands, leading to a strengthening of hypsistenocephaly on Ceylon, and to curly hair on the Andaman Islands, together with a strong darkening of the skin and with the formation of a negritto complex of characters. This point of view is in contradiction to the customary contrapositioning of a negritto group of populations to a Veddoid or Ceylon—Sundan group. It is, however, in the light of the results of the analysis of craniological material, the only correct one.

INDONESIANS AND DRAVIDS

On the basis of somatological material it is possible to state that the anthropological complex which characterizes Dravids differs from the Veddoid complex proper by the retention of negroid characters. This is also connected with the soft facial tissue and with the larger number of individuals with comparatively curly hair (*P.* and *F.* Sarasin, 1892—3, B. Guha, 1935, G. Olivier, 1961). From the methodological point of view, this material is not without its faults, but in spite of this it allows direct comparison of the anthropological type of the Veddas with populations speaking Dravidian. The results of this compa-

Indication	Measurement	Tamils	Marvars	Central regions of India (summarized values)	Bengaliese	Nepaliese
1	cranial length	178.9 (38)	175.6 (21)	176,3 (91)	175.0 (37)	176.9 (47)
8	max. cranial breadth	131.8 (38)	131.4 (38)	132.3 (91)	132.4 (43)	132.6 (47)
17	basion-bregma height	135.9 (38)	132.5 (38)	133.3 (91)	131.9 (14)	132.8 (47)
8:1	cranial index	73.8 (38)	74.6 (21)	75.1 (91)	76.0 (37)	75.1 (47)
17:1	height-length index	76.3 (38)	75.2 (21)	75.7 (91)	75.7 (14)	75.3 (46)
9:8	transversal-frontal index	72.2*	70.9*	69.6*	69.6*	68.6*
40	length of the facial base	97.7 (38)***	97.3 (36)**	98.1 (23)**	96.2 (43)**	95.8 (42)**
45	bizygomatic breadth	127.7 (38)	124.4 (21)	124.3 (79)	126.5 (35)	127.2 (44)
48	upper facial height	64.9 (38)	—	66.4 (61)	64.7 (13)	67.9 (43)
51	orbital breadth from mf (left)	42.2 (3)	—	—	42.2 (14)	41.1 (48)
51a	orbital breadth from d (left)	39.4 (38)	36.6 (17)	37.6 (85)	37.7 (50)	39.7 (48)
52	orbital height (left)	32.5 (38)	31.7 (38)	32.6 (85)	32.3 (49)	33.0 (48)
54	nasal breadth	24.6 (38)	24.0 (38)	24.5 (88)	24.3 (47)	25.7 (48)
55	nasal height	49.5 (38)	46.5 (38)	48.5 (88)	48.9 (49)	49.7 (48)
72	total facial angle	83.5 (35)***	—	—	84.1 (9)***	83.2 (43)***
45:8	horizontal faciocerebral index	96.9*	94.7*	94.0*	95.5*	95.9*
48:17	vertical faciocerebral index	47.8*	—	49.8*	49.1*	53.4*
48:45	upper facial index	50.8*	—	53.4*	51.1*	51.1*
52:51	orbital index from mf (left)	77.0 (3)	—	—	76.4 (13)	80.5 (48)
52:51a	orbital index from d (left)	82.4 (38)	84.4 (17)	86.8 (85)	83.6 (49)	85.3 (48)
54:55	nasal index	51.3 (38)	46.3 (7)	50.6 (88)	50.6 (47)	51.8 (48)

*) *Index of mean values.*
**) *Corrected using G. Shima's amendment.*
***) *2.0 deducted from the angle from the measured alveolar point.*

rison lead to a very critical attitude towards the classificational schema of E. Eickstedt, because he placed the Veddas among the europeoid groups and the populations speaking Dravidian into the negroid race (E. Eickstedt, 1934). In order to evaluate the position of the Dravids objectively according to the craniological information, the unfortunately scanty information on the craniology of the almost contemporary inhabitants of India and Nepal (*tab. 20*) was taken into consideration.

1. Tamils. This series was compiled during the maceration of the corpses of coolies who died in Singapore (*tab. 20*). It is described by G. Harrower (1926): Measurements of skulls kept in the Museum of Anthropology and Ethnography (5499—73, —74) and the Army Medical Academy (802) in Leningrad are added.

2. Marvars. A heterogenous series, measured by various researchers. The mean values of this series were published by M. Tildesley, who gathered together all individual measurements published, and used the series for comparison with the inhabitants of Burma, on whom she carried out measurements (M. Tildersley, 1921).

3. The central regions of India. This is a heterogenous series obtained from the summary of the results of many authors. The mean values are calculated and published by U Din-Lian and G. Morant in the work mentioned on the classification of Asiatic races. The ethnical appurtenance of the series is not clear, but we can apparently state with some justification that it represents nations speaking Indian proper languages. The skulls which form the series, are collected especially from the central regions of India, even if a certain part of them comes from southern and north-eastern regions. It is, therefore, possible that there is a degree of Dravidian mixing.

4. Bengalians. The skulls were measured by various researchers. The individual measurements published were summarized by G. Morant (1923). He writes that he carefully excluded all skulls which did not show their owners to be of the Hindu faith and to have spoken an Indian language. The greater part of the skulls belong to Bengalians. Four skulls were added from the Museum of Anthropology and Ethnography in Leningrad (collection 5499, nos. 69—72).

5. Nepalians. A heterogenous series both from the ethnical point of view appurtenance and from that of origin, useful only for judging the craniological type of the inhabitants of Nepal as a whole. It was measured by various authors. A review of these published measurements was compiled and published by G. Morant in the first work on the classification of Asiatic races, which I have referred to above.

When comparing these five series, it is apparent that the craniological differences between Dravidian and Indian speaking people are not great. Dravidians do not have, on the whole, a wider nose than Indians, and are not more prognathic. It can be seen that the craniological material which we have at our disposal is too small to allow us to establish with any certainty the somatological nature of the differences between the inhabitants of the southern and the central regions

of India. The Marvars, for example, have the narrowest nose of all the groups compared. The heterogenous character of the series was here apparent. In spite of this, there is no reason to ignore the somatological information, because it gives unequivocal and on the whole reliable results: the inhabitants of southern India have a lighter skin, a wider nose and thicker lips than the inhabitants of the central regions. The paleoanthropological material suggests that southern India alwasy belonged to the belt of the spread of the anthropological complexes inclining towards the equatorial type (V. P. Alexejev, 1964). A craniological comparison of Veddas and Dravids shows that the Veddas have a wider nose. This observation confirms the basic conclusion from the existing anthropological information—that the Veddas are more negroid than the Dravids. There is no reason, therefore, to seek an independent ancient centre for the formation of races on Indian territory; the anthropological structure of the people speaking Dravidian is of mixed origin and formed in the process of a long-term mixing of equatorial and Europeoid elements. The equatorial elements became part of the Dravidian speaking people in a less gracialised form than is seen with Veddas. The Dravids, therefore, like the Veddas, belong, in comparison with Indonesians, to a different circle of the racial complexes, and are not directly connected with them by a genetical relationship.

CONCLUSION

Analysis of the craniological material indicated a craniological united of inhabitants of the Sundas and Maluccas islands. A mixing of equatorial elements can be observed on the Maluccas Islands, characteristic for Papuans. The main ethnical population of the Sunda Islands represents a transitive form from the anthropological point of view, arising from a mixing of mongoloid and equatorial types. The combination of characters is, however, such among Indonesians that it makes it possible to see an independent racial branch in the mongoloid variants, whose morphological individuality cannot be explained merely by the mixing of eastern mongoloids and equatorial forms. A similar complex of characters can be seen on the Phillipine Islands, but in connection with that equatorial variant which also appears on the Melanesian Caniet island. This variant is less specialized than the remaining Melanesian complexes, and it is possible that it was an initial prototype for them. The negrittos of Luzon differ little from the Tagals from a craniological point of view. This leads to the question of their common origin, and therefore of the formation of a negritto complex, in this case on the basis of a different combination. The only factor which could have caused this process is adaptive variability. Similarly, Andamanese are comparable to Veddas, which in this case also suggests an independent structure of the negritto complex on a veddoid basis under the influence of adaptive factors. By this means we come to the conclusion that there was a parallel origin of negritto forms in various regions of South-East Asia, and that it is not correct to combine them in a single negritto population group. The negritto race, therefore, loses its right to an independent place in racial systematics. The speaking Dravidian people are, from the anthropological point of view, the result of a mixing of veddoid elements with europeoid. By this means it is possible to trace the line of the genetical link joining the Draviadin speaking people and the inhabitants of the Andaman Islands. The initial anthropological complex is apparently just that which the Veddas represent.

III THE CRANIOLOGICAL TYPE OF THE MALAYANS

HISTORY OF THE STUDY

The history of the study of the craniological material of the Malayans can be practically reduced to three publications. Extensive original material on the craniology of the Malayans was published by E. Schmidt (1887). His measurements were for many years the basis, and even, it seems, the only source of information, on the various craniological characters of the Malayans. The mean values of this series were calculated and published by M. Tildesley (1921). U Din-Ling and G. Morant, in addition to the data of E. Schmidt, determined a flattening of the facial skeleton in Malayan skulls on the nasion and frontomalar points, expressed by the corresponding index. This values are given in their paper, to which I have already referred. Finally, in the basic publication of N. N. Cheboksarov, there are given the results of his measurements of Malayan skulls, among which he included also Indonesian skulls. These are the same collections which serve also as material for our study, but they are published summarily; only male skulls were studied. For comparison with his information, Cheboksarov, used that of E. Schmidt, and besides this he added to the angle measurements the value of the index of the upper facial flattening which made it possible to compare it better with other information on the craniology of Asiatic populations.

THE ORIGIN OF THE MATERIAL

All the craniological material which we have at our disposal is kept in the Museum of Anthropology and Ethnography of the Academy of Sciences of the Soviet Union (collection no. 5499). This collection, we may remember, was obtained in the year 1841 from the Army Office of the Dutch East Indies. An exception is one female skull, measured at the Faculty of Normal Anatomy of the Army Medical Academy (no. 799). It was obtained in the year 1891. Almost all the skulls belonged to Malayans who lived in towns, particularly on Sulavese. Nonetheless, there is no reason to doubt the ethnical appurtenence of the skulls, because it is given exactly in the accompanying list of material. Altogether 10 male and eight female skulls were measured. Sex was determined according

Average Measurements and Indices of Malyan Skulls TABLE 21

Indication	Measurement	♂		♀	
		n	$\bar{x}$	n	$\bar{x}$
1	cranial length	10	179.1	8	169.8
8	max. cranial breadth	10	139.9	8	140.1
17	basion-bregma height	10	138.8	8	132.1
20	auricular height	10	117.1	8	112.8
5	basicranial length	10	101.5	8	97.5
9	minimal frontal breadth	10	95.1	8	93.7
12	occipital breadth	9	108.3	7	103.7
	supraorbital arches (1—6 Martin)	10	2.10	8	2.00
	processus mastoideus (1—3)	10	2.70	8	1.88
8:1	cranial index	10	78.2	8	82.7
17:1	height-length index	10	77.6	8	77.9
9:8	transversal frontal index	10	68.1	8	66.9
9:12	fronto-occipital index	9	88.0	7	90.3
40	length of the facial base	10	101.3	8	98.9
45	bizygomatic breadth	10	135.9	8	132.2
48	upper facial height	10	71.2	8	68.1
51	orbital breadth from mf (left)	10	42.8	8	41.8
51a	orbital breadth from d (left)	10	39.8	8	38.6
52	orbital height (left)	10	33.8	8	33.6
54	nasal breadth	10	26.0	8	26.2
55	nasal height	10	56.3	8	52.5
DC	dacryal breadth	10	20.4	8	20.7
DS	dacryal height	10	9.9	8	8.8
SC	symotic breadth	10	8.3	8	8.7
SS	symotic height	10	3.2	8	2.6
32	frontal angle (ma-me)	10	87.2	8	87.2
	frontal angle (gl-me)	10	81.5	8	80.6
72	total facial angle	10	83.9	8	82.0
73	middle facial angle	10	86.1	8	83.9
74	alveolar angle	10	74.1	8	74.1
75/I	angle of nasal bones to facial profile	9	14.7	8	11.4
77	nasomalar angle (fm-n-fm)	10	140.5	8	142.8
	zygomaxillar angle (zm-ss-zm)	10	128.7	8	129.2
	depth of fossa canina (left. in mm.)	10	3.7	8	3.5
40:5	index of facial prognatism	10	97.2	8	101.6
45:8	horizontal faciocerebral index	10	97.2	8	94.4
48:17	vertical faciocerebral index	10	51.3	8	51.7
48:45	upper facial index	10	52.4	8	51.6
52:51	orbital index from fm (left)	10	79.1	8	80.7
52:51a	orbital index from d (left)	10	85.0	8	87.4
54:55	nasal index	10	46.3	8	50.0
DS:DC	dacryal index	10	49.1	8	42.4
SS:DC	symotic index	10	40.5	8	30.8
	index of the curve of the facial bones (U-Din-Lian)	10	25.3	8	22.4

to the instructions in the record, and was verified by myself with the help of morphological characters. Preference was given, in deciding, to the record, so that, for example, the morphologically apparently male skull 5499—29 is included among the female skulls, in accord with the record (*tab. 30*).

GENERAL CRANIOLOGICAL CHARACTERIZATION

Measurements and shape of the brain-case.

The measurements of the brain-case are average in the Malayan series (*tab. 21*). The average of the horizontal measurements, i.e. of the length and width, give a cranial index within the limits of mesocrany, but close to brachycrany. The ratio of breadth and height approaches 100 %, i.e. definite hypsistenocrany. The frontal bone is medium broad both asbsolutely and relatively, high, and well domed. The relief is weak in the supraorbital region on the frontal bone; processus mastoidei are, however, large.

The measurements and shape of the facial skeleton.

The wide face is quite big, especially if we consider that in South-East Asia and the adjacent regions of Oceania there esixt no anthropological types whatsoever with large facial dimensions. We can repeat the same with regard to the height of the face, but this is relatively not large (the comparatively small values of the upper facial and especially of the vertical facial indices show a great facial width and considerable cranial height). In spite of this Malayans

differ substantially, in facial measurements and the ratio of facial measurements to cranial ones, from the northern mongoloids.

Structure of the nasal region.

The nose is very high, combined with a very small height of the subnasal region; the width of the pyriform aperture is large. On the whole the nose is comparatively narrow, because the nasal index, especially in male skulls, does not lie much below 50 %. In this connection I must call to mind everything which has been said about the dimensions of the height of the nose in Papuans. Here it is also true that with a high percentage of skulls having fossae praenasales (90 % in the male and 50 % in the female series), a certain increase in nasal height could have occured.

The projection of the nasal bones is very weak and in Malayans is even weaker than in Indonesians. Among northern mongoloids, however, there are no groups with such a slight projection of the nasal bones, if we consider only the angle of the nasal bones in relation to the value of the facial profile. Even according to measurements based on the height of the nasal root, however, the Malayan skulls are similar to the series of northern mongoloids with the flattest noses, though they do not occupy extreme values when compared with them.

Vertical profilation of the facial skeleton.

The Fogt-Flower index of the projection of the facial skeleton is practically equal to 100 units in male skulls, and is higher than in the female skulls. The total facial angle is somewhat larger than in the equatorial groups, but substantially smaller than with the northern mongoloids. A great difference in the angle of the total facial profile and its central part shows strong alveolar prognathism. All in all, the vertical profilation of the facial skeleton distinguishes Malayans quite emphatically from northern mongoloids, while making them comparable with the equatorial populations.

The horizontal profilation of the facial skeleton.

Both angles of profilation in the series studied show unusually low values. They are, it is true, somewhat higher in the female series, but do not in any case reach the values of northern mongoloid skulls. In the male skulls the horizontal values of the facial skeleton are, indeed, europeoid. In this connection it is possible to repeat what has been said above on the neutrality of the southern mongoloids, especially of Indonesians, in respect of this character. Even to, however, the value of the nasomalar angle in Malayan skulls is very small. The hypothesis of an equatorial admixture is not acceptable, because the measurements of the zygomaxillar angle in equatorial groups, especially in Papuans and Malayans, does not support this. Only one possibility remains, to consider this low value of the nasomalar angle in the ten Malayan skulls to be a consequence of an unrepresentative sample, the more so that the substantially more numerous series where the angle was measured by U Din-Lian and Morant gives a higher value.

Without regard to the considerable profilation of the facial skeleton, the fossae caninae are flattened.

GENERAL CHARACTERISTICS

The general differences in the characteristics of the craniological type of the Malayans, if we combine the information which we have at our disposal with that of E. Schmidt, are negligible (*tab. 22*); the only exception is the horizontal profilation of the facial skeleton, more concretely the upper angle of the horizontal profilation. Neither in morphology nor in geographical distribution are there such differences of information as to contradict this union—that is to say, neither series (Schmidt's or our) can be localized within the Malayan area by any different character; they supplement complete support each other, on the contrary, in this direction. They have average cranial measurements, approaching brachycranial shape, and are emphatically hypsistenocranial. The frontal bone is medium wide, vertically aligned, the cranial relief is not very strong. The measurements of the facial skeleton are large, the skeleton itself is prognathic and quite strongly profilized in the horizontal plane. The alveolar prognathism is marked. The nose is high, and wide absolutely, according to the index, relatively very narrow; it projects very weakly, and in this character the Malayans hold a position appraoching the minimum within the framework of the mongoloid race generally.

TABLE 22

Average Measurements and Indices of Malyan Skulls serie (combined)

Indication	Measurement	n	$\bar{x}$
1	cranial length	88	175.2
8	max. cranial breadth	87	141.9
17	basion-bregma height	86	137.6
8:1	cranial index	10	117.1
17:1	height-length index	—	78.5*
9:8	frontal-transversal index	—	66.0*
40	length of the facial base	86	99.7**
45	bizygomatic breadth	83	133.5
48	upper facial height	83	70.2
51	orbital breadth from mf (left)	10	42.8
51a	orbital breadth from d (left)	83	39.2
52	orbital height (left)	84	33.5
54	nasal breadth	83	26.1
55	nasal height	85	52.4
72	total facial angle	10	83.9
45:8	horizontal faciocerebral index	—	93.8*
48:17	vertical faciocerebral index	—	51.0*
48:45	upper facial index	—	52.7*
52:51	orbital index from mf (left)	10	79.1
52:51a	orbital index from d (left)	83	85.9
54:55	nasal index	—	49.8*

*) *Index of mean values.*
**) *Corrected using G. Shima's amendment.*

Average Measurements and Indices of Skulls of the Inhabitans of Burma TABLE 23

Indication	Measurement	Inhabitants of Burma				Naga			
		♂		♀		♂		♀	
		n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
1	cranial length	89	173.7	73	166.8	14	181.3	8	173.1
8	max. cranial breadth	89	142.7	74	135.6	18	137.9	10	132.9
17	basion-bregma height	87	136.0	74	130.2	16	136.6	8	127.6
8:1	cranial index	88	82.2	73	81.5	14	76.9	8	76.7
17:1	height-length index	87	78.4	74	78.1	11	76.7	5	76.6
9:8	transversal-frontal index	—	65.3*	—	66.2*	—	67.3*	—	65.0*
40	length of the facial base	82	97.8**	67	91.8**	15	97.2**	6	90.6**
45	bizygomatic breadth	84	133.1	63	123.9	45	131.6	22	125.1
48	upper facial height	82	70.8	67	65.5	60	66.1	31	63.9
51	orbital breadth from mf (left)	56	43.6	64	41.8	20	42.3	15	41.5
51a	orbital breadth from d (left)	29	39.3****	—	—	45	38.5	27	37.8
52	orbital height (left)	85	34.6	65	34.3	28	33.9	17	32.4
54	nasal breadth	85	26.8	65	25.7	64	26.8	32	25.7
55	nasal height	85	53.1	67	49.5	28	52.1	21	47.9
72	total facial angle	54	83.7****	66	83.5****	—	—	—	—
48:8	horizontal faciocerebral index	—	93.3*	—	91.4*	—	95.4*	—	94.1*
48:17	vertical faciocerebral index	—	52.1*	—	50.3*	—	48.4*	—	50.1*
48:45	upper facial index	—	53.2*	—	52.9*	—	50.2*	—	51.8*
52:51	orbital index from mf (left)	56	80.1	64	81.8	20	78.9	15	78.5
52:51a	orbital index from d (left)	29	85.9	—	—	8	84.9	10	84.5
54:55	nasal index	85	50.6	65	51.7	28	51.4	19	54.4

*) *Index of mean values.*
**) *Corrected using G. Shima's amendment.*
***) *Measurement measured from the lacrymal point (the same goes for the index).*
****) *2.0 deducted from the value of the angle measured from the alveolar point.*

THE MALAYANS AND THE NATIONS OF THE BURMESE UNION

Extensive craniological material concerning the inhabitants of Burma was described in detail in a special work by M. Tildesley, which we have already used for our of comparisons. Without regard to the overall populational theory of measurement of the English biometrists and their consequent general opposition to the fixing of the racial appurtenance of individual skulls, Tildesley classified three craniological types within the Burmese series which she studied — A, B, and C, based on a purely morphological view. The mean values, according to the series, relating to these three types are published separately. Type C particularly caught her attention — with a high and narrow face, narrow nose and high nasal root. The europeoid appearance of skulls belonging to this type is apparent, but this fact is an insufficient basis for genetical conclusions, since a small number of skulls with such morphological peculiarities (M. Tildesley had altogether eight!) can be found in any mongoloid series.

I have therefore combined the information on all three types, and added to it the information on the skulls measured and described by W. Turner (1899). Quite an extensive series resulted, according to which a rough consideration can be made on the craniological type of the inhabitants of Burma (*tab. 23*).

A further series useful for comparing the craniological type of a rather isolated ethnical group, whose representatives speak one of the Tibetan-Burman languages, is the series Naga of skulls. It is described by E. Kitson and G. Morant (1933). The series is not large, but is measured according to a detailed programme and substantially supplements the knowledge of the morphological variability of the skulls of the Tibetan-Burman nations of Burma, the more so because these two series more or less exhaust the craniological material on the native inhabitants of the Burmese Union.

For the Naga skulls there exists no information on the vertical profilation of the facial skeleton; the inhabitants of Burma have orthognath facial bones, in which they do not differ from the northern mongoloids. In this character they belong to the belt of orthognath variants which includes South-East Asia to the north of Indonesia and India. Malayans are somewhat similar in this respect to the southern groups of Indonesians. The inhabitants of Burma in this character resemble those of the Phillipine Islands, although, as is known by the values of the nasal index, the equatorial element is substantially more strongly represented in the Phillipines. This is also evidenced by the somatological observations. It is therefore possible, within the framework of the nations of South-East Asia belonging to the southern branch of the mongoloid race and speaking Indone-

sian or Tibetan-Burman, to classify, on the basis of the craniological material, two groups of populations — one having within its structure a larger admixture of equatorial elements, which can be called, in accord with the geographical area, the Sundas-Phillipine group, the other, with a wider nose, and orthognath, within whose structure the mixture of equatorial elements is smaller, and which could be called the south Asian mainland group. Within the framework of this latter group the differences between the inhabitants of Burman and Naga people, have a secondary character, even if they indicate that within these two large groups of populations differentiation occurs according to numerous characters. The Naga differ, for example, from the inhabitants of Burma by a more gracile facial skeleton and by mesocrany, but these very characters, as is well known, are dependent on paratypical factors.

Nor does there exist an absolute morphological border between the two groups of populations — as far as the vertical facial profilation and the width of the nose are concerned, Battaks are more similar to the representatives of the mainland group than to those of the island group. The series of Battaks is of course a very small one. The same typological mode of variability is not, however, expressed perfectly in this case, and is obscured by the local variability, caused by random factors. I did not deal with the problem of Protomalayans and Deuteromalayans with the available craniological material, since it gives no further information to that obtained already in the somatological study.

MALAYANS AND VIETNAMESE

As far as the craniology of Vietnam is concerned, we would like to know it better. As with the other regions of South-East Asia, Vietnamese skulls are very insufficiently represented in craniological collections. The only material suitable for use in judging the craniological type of the Vietnamese is a small series of male skulls having a heterogenous character. The origin of these skulls is not very clear, they were measured by various researchers, according to whose measurements G. Morant calculated mean values. Unfortunately, information on the variability of many important characters is missing, and this series can therefore be evaluated even less than the remaining material, which again was studied according to only a very limited programme.

Among the characters which were not determined in this series of Vietnamese skulls is the vertical profilation of the facial skeleton. The morphological approach which we used earlier to distinguish island population groups from mainland ones cannot therefore be used. If we judge according to the width of the pyriform aperture, and according to the relation of the nasal measurements, expressed by a nasal index, the latter series of skulls does not contain any strong equatorial characters and the Vietnamese must therefore be placed in the south Asian mainland group. This conclusion corresponds entirely to the results of the somatological study (Nguen-Din-Choa, 1963). To put it another way, the Vietnamese, like the Tibetan-Burman people of the Burmese Union which were studied, belong to the same group of populations as the Malayans (*tab. 24*),

TABLE 24

Average Measuremente and Cranial Indices of Vietnamense ♂

Indication	Measurement	n	$\bar{x}$
1	cranial length	27	177.0
8	max. cranial breadth	27	140.3
17	basion-bregma height	25	137.0
8:1	cranial index	—	79.3*
17:1	height-length index	—	77.4*
9:8	transversal-frontal index	—	67.3*
45	bizygomatic breadth	23	132.7
52	orbital height (left)	27	32.9
54	nasal breadth	26	26.2
55	nasal height	27	51.0
45:8	horizontal faciocerebral index	—	94.3*
54:55	nasal index	26	51.4

*) *Index of mean values.*

THE MALAYANS AND THE INHABITANTS OF TAIWAN

The original inhabitants of Taiwan, who speak Malayan-Indonesian languages, are known under the Chinese name of Gao-Shang, which means mountain people. This term is taken up in Soviet ethnographical literature also, although with the completely correct reservation that it has no ethnical significance (Narody Vostotschnoy Asii, 1965 p. 603—604). The craniology of the population of Taiwan is dealt with in many Japanese works, which I know only according to bibliographical references, but which remain inaccessible to me. Two works were used — the paper of Hung-Lin Wu (1959) on the craniology of Atayals, or as they are otherwise known, Tayals, and that of Teh-Maw Juan (1960) on the Pin Pu series of skulls. The information, according to the measurements given in these works, is summarized in *tab. 25*.

The two series, differing in the measurements of the face and of the skull, are comparable in their indices. As might be expected, they are much more similar to the south mongoloid groups than to the north mongoloid. Within the framework of these south mongoloid populations, they resemble those groups which I have previously called island groups, and not the mainland branch. Put in a formal way, the vertical profilation of the facial skeleton, which we have used above in distinguishing mainland and island forms, does not help us here, because the overall facial angle in both series is characterized by orthognathism. Let us remember, however, that orthognathism also characterizes the inhabitants of the Phillipines. The Tagals and Aetas have, however, very wide noses, which makes it possible to place them in the group of populations with a considerable equatorial admixture, which is incidently in complete

Average Measurements and Indices of the Skulls of the Inhabitants of Taiwan TABLE 25

Indication	Measurement	Atajals ♂ n	Atajals ♂ $\bar{x}$	Atajals ♀ n	Atajals ♀ $\bar{x}$	Pin Pu ♂ n	Pin Pu ♂ $\bar{x}$	Pin Pu ♀ n	Pin Pu ♀ $\bar{x}$
1	cranial length	48	177.7	31	172.5	52	180.8	38	174.0
8	max. cranial breadth	47	137.0	32	134.0	52	141.5	37	135.0
17	basion-bregma height	43	133.9	30	129.8	42	140.9	32	134.0
8:1	cranial index	47	76.9	31	77.8	51	78.5	36	77.3
17:1	height-length index	43	75.5	30	75.4	42	78.3	30	76.4
9:8	transversal-frontal index	47	67.4	32	67.9	50	65.6	35	67.1
40	length of the facial base	39	94.6	29	89.7	34	95.2	29	93.1
45	bizygomatic breadth	45	131.5	25	124.6	26	136.0	20	128.9
48	upper facial height	44	64.9	30	60.1	42	69.4	31	64.9
51	orbital breadth from mf (left)	48	41.6	32	40.0	40	41.5	29	40.8
51a	orbital breadth form d (left)	48	39.7	32	38.6	—	—	—	—
52	orbital height (left)	48	34.3	32	33.7	41	35.3	29	35.1
54	nasal breadth	48	26.5	32	25.4	46	26.5	29	26.3
55	nasal height	48	50.2	32	47.2	41	51.5	30	46.4
72	total facial angle	43	84.6	30	84.4	35	86.9	25	84.0
45:8	horizontal faciocerebral index	45	95.9	25	93.3	25	96.0	20	96.5
48:17	vertical faciocerebral index	—	48.5*	—	46.3*	—	49.3*	—	48.4*
48:45	upper facial index	41	49.0	23	48.5	26	51.0	18	50.2
52:51	orbital index from mf (left)	48	82.1	32	82.6	40	86.8	29	85.5
52:51a	orbital index from d (left)	—	86.4*	—	87.3*	—	—	—	—
54:55	nasal index	48	52.5	32	53.7	40	53.2	26	54.8

*) *Index of mean values.*

agreement with their somatological characters. In both series from Taiwan the nose is both absolutely and relatively wide. The value of the nasal index is considerably higher than in Malayans, Burmese and Naga. The Tagals and Aetas have, it is true, wider noses, but in spite of this the inhabitants of the island of Taiwan resemble them rather than the mainland populations. Only one conclusion can follow from this, that there was a mixed south mongoloid complex, strongly influenced by a protomorphic Melanese admixture, which formed the basis of the anthropological structure of Tagals. It also spread northwards, and reached the island of Taiwan. There it left the basis of the anthropological structure of the Gao-Shang, but there entered in addition south mongoloid elements of mainland origin. By this means Malayans, both morphologically and genetically, move further away from the inhabitants of Taiwan, then they do genetically from the inhabitants of the Phillipine Islands. The Malayans and the Gao-Shang apparently belong to the groups of populations often classified with southern mongoloids; the first belongs to the mainland, the second to the island group. However, the opposite position of this island group, as far as nasal width is concerned, for example, calls to mind again the fact that the line of limits between these two groups of populations has only a relative significance.

THE MALAYANS AND THE KHONTAI

Information on the inhabitants of Thailand is just as unsatisfactory as that on the craniology of the Vietnamese. There are the measurements of various authors, summarized by G. Morant, whose mean values were published in the same work. The mean values are published for male skulls only, and even these are not numerous. The programme of measurements is not extensive, and many of the measurements which we currently use for comparison are missing (*tab. 26*). The origin of the material could also

TABLE 26

Average Measurements and Indices of Khontai Skulls used

Indication	Measurement	n	$\bar{x}$
1	cranial length	7	177.9
8	max. cranial breadth	11	143.9
17	basion-bregma height	5	137.8
8:1	cranial index	—	80.9*
17:1	height-length index	—	77.5*
9:8	transversal frontal-index	—	66.3*
45	bizygomatic breadth	9	136.3
48	upper facial height	2	71.5
51	orbital breadth from mf (left)	3	40.3
52	orbital height (left)	7	32.3
54	nasal breadth	7	27.1
55	nasal height	3	51.3
45:8	horizontal faciocerebral index	—	97.7*
48:17	vertical faciocerebral index	—	51.9*
48:45	upper facial index	—	52.5*
52:51a	orbital index from d (left)	3	81.0
54:55	nasal index	3	51.1

*) *Index of mean values*

be better described, since with the complexity of the ethnical structure of Thailand there is no guarantee that only Khontai skulls and not those of representatives of minority nationalities got into our small series.

While accepting all these reservations, we can immediately mention a difference between the Khontai and the Vietnamese according to facial width. This, however, is the only great difference which we can rely on; in a similar way the Khontai skulls also differ from the Malayans, although to a lesser extent than from the Vietnamese. In other characters the differences from the Vietnamese are minor and do not form a definite complex. There is no information in the mean values published earlier by G. Morant about the vertical profilation of the Khontai. However, the size of the nasal index exceeds that of the Vietnamese and of the Malayans. On this basis we could suppose that the Khontai belong not to the mainland, but to the island group of populations, which would, however, contradict their geographical and historical area, which agrees with their present extent, and would also contradict their linguistic appurtenance, their known ethnical history, and finally even our sense of logic. Fortunetely the degree of difference between the Thai craniological series and the Malayan and Vietnamese is not such as to make the proof, or even the illustration of the hypothesis possible. According to the value of the nasal index, the Khontai are even closer to the populations belonging to the mainland group than to the island group. As with the Malayans, the Burman nations, the Naga and the Vietnamese, the Khontai have a position opposite to that of the nations of Indonesia, the Phillipines and Taiwan (*tab. 26*).

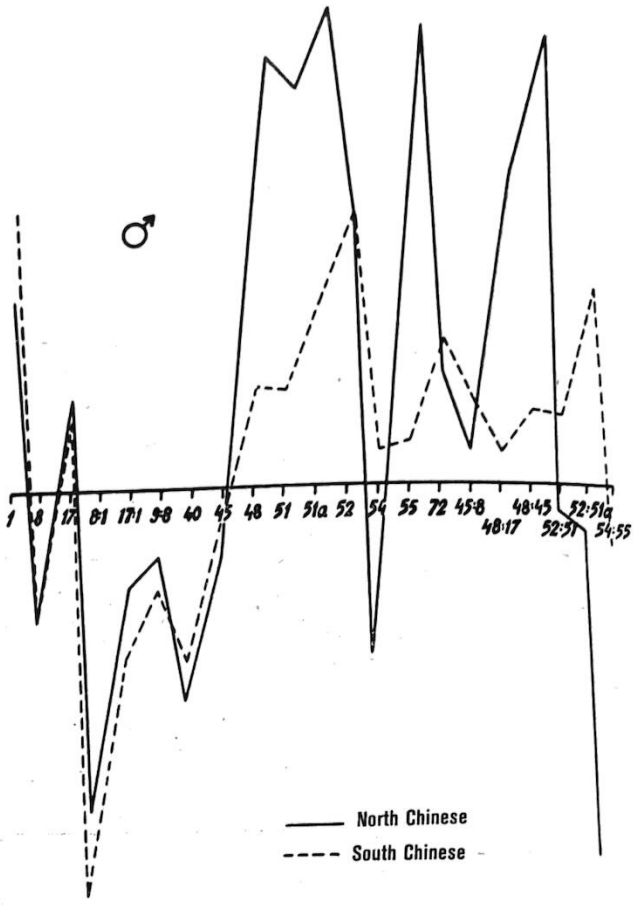


Fig. 12: The comparative distance of the northern and southern Chinese from the Indonesians. The general mean values of the Indonesian series were taken as a basis.

THE MALAYANS AND THE SOUTH CHINESE

There exists a special study in which is described the gradual increase of the nasal index of Chinese according to how far south we go (Wang-Shin-Chun, 1954).

The author used craniological series de demonstrate this fact, therefore the conclusion given, strictly speaking, can relate only to craniological material. The author himself presumes that the geographical regularity in the extent of the nasal index, which he points out, is evidence of a connection between the geographical variation of the nasal index and climate. The increase in the width of the nose in a southern direction could be the result of a mixing with southern elements. The somatological material indicates the same character — an increase in the nasal index in south China, parallel with the appearance of the kind of characters which indicate the influence of equatorial forms of a southern origin (N. N. Cheboksarov, 1947. See also: N. N. Cheboksarov: K voprosu o proischoshdenii kitaicev, 1947). Paleoanthropological research in the last few years has brought direct indications of this; this concerns the spread of wide-nosed and prognathic forms in the Hua-Hsien valley in the neolithic age (Gen Gin, 1962). The seven regions of China were, therefore, apparently always a zone of contact of mongoloid populations with groups within whose structure there existed an equatorial admixture. This circumstance justifies the fact that the southern Chinese series were used for comparison in judging the craniological type of Malayans.

Two large heterogenous series of skulls of southern Chinese have been published. The first of them was measured and described by S. Poniatowski (1909), the second was measured by various researchers; a review of their information was published by G. Morant in the work which has been mentioned on Tibetan skulls. The significance of using summary information on the craniology of the southern Chinese is, however, limited, as a consequence of the vast area which southern groups of the Chinese people occupy, and as a result of the interpopulational differences which apparently must exist in such a large territory. Therefore, instead of using this summarized information in a generalized form (the summarized mean values published by S. Poniatowski and G. Morant), the published material is consireded according to the definite geographical regions. This material is joined in three groups. Two of them are of island origin, and represent the inhabitants of the islands of Taiwan and Hainan, the third represents the inhabitants of the province of Fuczian. The series from Fuczian province and from the island of Hainan are described by G. Harrower (1926, 1928), the skulls from the island of Taiwan were mea-

Indication	Measurement	♂			♀
		Funczian	Taiwan	Hajnan	Taiwan
1	cranial length	179.9 (36)	179.7 (63)	168.3 (39)	172.7 (20)
8	max. cranial breadth	140.9 (36)	138.3 (53)	147.8 (39)	134.3 (20)
17	basion-bregma height	137.8 (36)	136.9 (49)	136.0 (39)	131.0 (19)
8:1	cranial index	78.8 (36)	77.1 (63)	87.9 (39)	77.8 (20)
17:1	height-length index	77.0 (36)	76.2 (49)	80.8 (39)	76.0 (19)
9:8	transversal-frontal index	64.9***	64.5 (49)	62.9***	66.0 (20)
40	length of the facial base	97.3 (36)*	95.9 (56)	94.8 (39)*	92.4 (15)
45	bizygomatic breadth	132.6 (36)	133.6 (61)	134.0 (39)	124.3 (19)
48	upper facial height	73.8 (36)	70.6 (55)	70.6 (39)	66.6 (16)
51	orbital breadth from mf (left)	40.5 (36)**	42.1 (49)	40.2 (39)**	41.2 (20)
51a	orbital breadth from d (left)	38.5 (36)	40.1 (49)**	38.2 (39)	39.2**
52	orbital height (left)	34.8 (36)	35.5 (49)	34.1 (39)	33.8 (20)
54	nasal breadth	25.2 (36)	26.2 (63)	25.4 (39)	25.6 (20)
55	nasal height	52.6 (36)	52.4 (63)	51.6 (39)	48.5 (20)
72	total facial angle	81.9 (39)****	83.7 (54)	82.7 (39)****	83.0 (15)
45:8	horizontal faciocerebral index	94.1***	96.6***	90.7***	92.6***
48:17	vertical faciocerebral index	53.6***	51.6***	51.9***	53.6***
48:45	upper facial index	55.7 (36)	52.7 (54)	52.7 (39)	53.5 (15)
52:51	orbital index from mf (left)	85.4***	82.2 (49)	84.8***	82.3 (20)
52:51a	orbital index from d (left)	91.9 (36)	88.5***	89.4 (39)	86.2***
54:55	nasal index	49.4 (36)	50.0 (63)	48.2 (39)	53.0 (20)

*) *With Shima's correction.*
**) *2 mm. deducted from maxillofrontale or 2 mm. added to dacryal breadth.*
***) *Index of mean values.*
****) *Corrected according to Shima's amendment.*

sured by the Japanese researchers I. Koganei and T. Weda, whose original works remained inaccessible to me. Their information is given according to the review of G. Shima (1933), but it is summarized in order to achieve a unity of mean values, because no geographical appurtenance was mentioned for either series (*tab. 27*). With the exception of the last series, they are formed of male skulls only.

What are, therefore, the craniological characters of the anthropological type of the southern Chinese? According to the profilation of the face in the vertical plane, they resemble the equatorial forms, being practically indistinct from the Malayans, the inhabitants of Burma and the Indonesians. The width of the nose is smaller than in these groups, but if we compare Indonesians, southern Chinese and northern Chinese according to this character, the southern Chinese are more similar to the Indonesians than to the northern Chinese. This similarity also occurs in the facial dimensions (*fig. 12*). For the drawing of a Mollison graph the combined series from the Canary Islands are used as the standard quadratic variations (J. Schwidetski, 1963, V. V. Ginzburg, 1963, V. P. Alexejev, 1969). It can be seen on the graph that the curve characterizing the craniological type of the southern Chinese runs nearer in the right-hand part of the graph to the straight line which forms the basis of the graph, and represents the craniological characters of Indonesians, than the curve joining the values of the measurements of the northern Chinese series. The southern Chinese, therefore, in complete agreement with geographical, historical, and genetical knowiedge belong to the mainland sub-group of the south mongoloid group of populations, that is to the same sub-group as the Malayans. Apparently, exactly this sub-group was the basic starting point for the formation of the southern mongoloids, and South-East Asia was the initial centre of the formation of the races in the region of the southern branch of the mongoloid race. The island sub-group, which—as has already been said above—was formed as a consequence of equatorial elements mixed in with this basic complex, represents the final result of the process of the formation of races in its island centre. This centre is, in relation to the initial centre, secondary one. The geographical boundary of the spread of southern mongoloids is therefore not identical with the spread of the linguistic regions or with the boundary of individual great languages. In the north of the area of the southern mongoloids, their boundary corresponds to that between the northern and the southern Chinese, not, therefore to the ethnical boundary between the Chinese and their southern neighbours. In the ethnogenetical aspect, this fact leads to the hypothesis of the extreme diversity of the roots of the formation of the southern Chinese, in an ethnical direction, as can be seen, which was not homogenous. The representatives of these roots apparently spoke Thai, Tibetan-Burman and also Monkhmerian langnages.

The craniological differences between individual territorial groups of southern Chinese, which we had supposed that we meet with when using not summariezed, but geographically determined data, turn out to be very slight. In view of my earlier conclusion, I am not inclined to consider the clear brachycrany

of the Chinese of Hainan to be particularly significant. Nor did the differences in the cranial index play any substantial part in this conclusion. It is, however, important to point out the peculiar combination of characters in the Chinese of Taiwan. Within the framework of the same craniological complex wnich is characteristic for the other southern Chinese groups, it is necessary to give attention to the increase in the width of the pyriform aperture and the decrease in the vertical profilation, that is, to exactly that combination which makes the Chinese of Taiwan close to the Gao-Shang. It occurs both in male and in female skulls. This very similarity in craniological characters of the native inhabitants of Taiwan does not allow this combination to be treated as coincidental. Apparently the Chines of Taiwan assimilated part of the local inhabitants (which is, by the way, not in contradiction to the historical information), and to they took into their composition the Gao-Shang complex of anthropological characters.

GENERAL CONCLUSIONS

On the basis of craniological information, we can, therefore, divide the southern branch of the mongoloid race into two independent groups of populations — the mainland south Asian and the island Sundas-Phillipine. To the first belong the inhabitants of the Burmese Union, Vietnam, Thailand, Malaya, south China; to the second—the inhabitants of Indonesia and the Phillipines. The basic morphological criterion for the distinction of the one group from the other is the proportion of the admixture of equatorial elements; in the composition of the island groups, this proportion is higher. The initial centre of the formation of races for the southern mongoloids is the mainland part of South-East Asia where, apparently, the southern mongoloids represented an independent branch in the structure of the primeval inhabitants. Several centres of the formation of races, secondary in relation to the initial centre, have been found on islands, where the formation of island groups of populations came about during a constant mixing with equatorial populations. The morphological boundary between the island and the mainland groups is not a clear one, and it is therefore impossible in this case to speak only of typological variability. This is understandable, and historically explicable: during the great spread of similar languages, chance variability must for many reasons have played a part in forming the race, and have led to local variability, especially in border regions.

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