Anatomy. — *The spread of primitive humanity and its links with the more differentiated races, as revealed by cephalic and cranial index curves.* By C. U. ARIËNS KAPPERS.

(Communicated at the meeting of December 19, 1936).

II. *The spread of 73—75—77(8)—80 cephalic index groups in Polynesia, America, Asia, the Arctic and Europe.*

Since the Polynesian islands, with the exception of the Sandwich group, are located on the same latitude as Melanesia and Australia, it is not strange that Indo-Melanesian and also "Australoid" elements are found on these islands, albeit sporadically and among the ancient population chiefly.

The curves [1]) of the male and female Maori skulls from New-Zealand (Table I fig. 1), have a distinct peak at 72. This opens the possibility of Australoid admixture, as also stated by MOLLISON, although among the male dolichocephalic skulls also the long-headed Indonesian type may occur. The Indonesian type, however, is most conspicuous by the high male cranial 76 peak.

Similarly the continuous and dotted curves of male cephalic indices of living Maori in Table I, fig. 4, show that among the present Maori both Indonesian cephalic index peaks, the 75 and 77 peak, occur [2]).

With the male and female Moriori skulls from the Chattam islands (Table 1 fig. 2) the dolichocephalic peak fails, but the 76 peak is just as pronounced as with the Maori skulls, thus confirming TREGEAR's, DUCKWORTH's, DONNE's and ROSINSKI's opinion that the extinct Moriori probably were closely related to the Maori.

This cranial 76 peak also occurs in the male skull curve of the other Polynesian islands (Table 1 fig. 3) and may correspond with the cephalic 77 peak, indicated with the male Samoans (dotted line fig. 5) and especially with the male Marquesans (fig. 6). Besides the small 78 elevation in fig. 3 might correspond with the 80 cephalic groups, in figs. 5 and 7.

While our cranial curves compared with our cephalic curves of these Polynesian islands give evidence of a once quite numerous but now decreasing Nesiot element in these islands, the 80, 82 and 86 elevations in the male cranial curve of fig. 3, corresponding with 81, 83 and 86 cephalic peaks, already indicate Asiatic admixture and the cephalic 79, 81, 83, 85 and 86 indices so prevailing with the present population of the Tonga, the

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[1]) In all my curves the index figure 70 stands for 70—70.9 etc.

[2]) The 79 and 81 peaks in the dotted curve of fig. 4 suggest that the majority of this group (as the same peaks in fig. 6) is of Neo-Polynesian origin.

Marquesas and the Society islands (Table I figs. 5—9) clearly show the increase of this element, responsible for the different aspect of most of the present Polynesians compared with the population of Nesiot origin. Yet, the 75, 77 and 80 elevations in figs. 5, 6 and 7 confirm SULLIVAN's and BUCK's statement that on the above mentioned islands Nesiot elements still occur. SULLIVAN, who emphasized their Negroid character, found this type quite numerous on the Marquesas, which agrees with the high 77 elevation in fig. 6. It is conspicuous also among the Samoans (note the 77 and 80 peak in fig. 5).

In this connection it is interesting to note that the bloodtype of STEPHENSON's Samoans (Sam., Table 111) closely approaches that of BIJLMER's Ambonese and Halmaheira people, (Amb., Hal. and Sahu Hal.) and BROUWER's Alorese and Pantarese (Alor, Pant.) as well as HEYDON's and MURPHEY's New Guineans (N.G.) and KALTHOFEN's Kai Kai Papuans [1]).

In the Sandwich islands, the Nesiot type is very rare nowadays. The cephalic curves of the male and female Hawaians, registered in Table 1 figs. 10 and 11, strongly resemble the Malayan type, as appears from the curves of HAGEN's, KOCH's and BOK's male Javanese and KLEIWEG DE ZWAAN's Menangkabau Malays, added to these figures.

KEANE–QUIGGIN–HADDON also speak of two elements in the Polynesian people, distinguishing an older "Indonesian" and later "Malayan".

Indo-Melanesian (Nesiot) types in America.

TEN KATE considered the six ancient hyperdolichocephalic skulls found by him in the Mexican part of the Peninsula of California, some other authors also the skulls from the Southern Californian islands recorded by BOAS as Melanesian in character and origin.

Similarly RIVET emphasized the Melanesian character of SØREN HANSEN's ancient Lagoa Santa skulls of Brazil and of his own Ecuadorian Paltacalo skulls, as did SULLIVAN and HELLMAN for the Ecuadorian Punin skull (ind. 70, 96) and VERNEAU for some ancient Columbian skulls. The same is said of the Brazilian Botocudos, the Patagonians and Fuegians.

Cultural arguments for an early transpacific influence on America are numerous (cf. RIVET, FRIEDERICI [2]), KOHLBRUGGE [3]), DIXON [4]).

Recently HRDLICKA [5]) pointed out that the ancient South-American and

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[1]) The bloodtype of BIJLMER's Mimika Papuans from the South coast of New Guinea (Mim, Table 111) lies nearer some Australian (Aus) bloodtypes (Mimika $r = 61.3$; $p = 28.7$; $q = 10$; North Australians $r = 66.2$; $p = 33.8$; $q = 0.0$, Burton Cleland) as also their cephalic indices do.

[2]) FRIEDERICI, Zu den vorkolombischen Verbindungen der Südseevölker mit Amerika Anthropos, Bnd. 24, 441 (1929).

[3]) KOHLBRUGGE, Systematisch en beschrijvend leerboek der Volkenkunde, 1930.

[4]) See: American aborigines, Toronto Press, 1933, p. 315.

[5]) Melanesians and Australians and the people of America, 1935.

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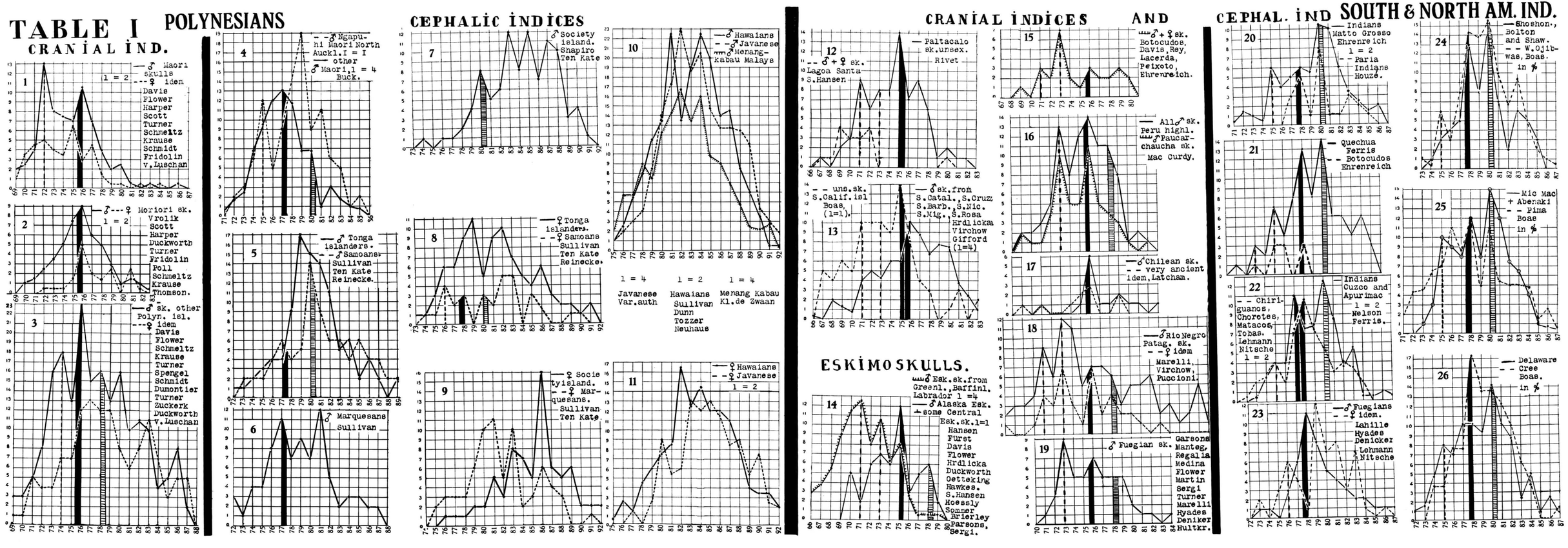

Californian skulls — in some respects — resemble also the Eskimo skulls and the more or less ancient Algonkin and Huron skulls from the North-Eastern States of N. America. Our curves confirm this view point for the l. br. index relations.

TEN KATE's Southern Californian skulls not being numerous enough to give a reliable curve, I registered in the dotted line of fig. 13 BOAS' unsexed ancient S. Californian skulls (in the continuous line HRDLICKA's, VIRCHOW's and GIFFORD's skulls) to compare them with RIVET's unsexed Paltacalo and HANSEN's Lagoa Santa skulls[1]) (fig. 12) and with the male Eskimo skulls of fig. 14.

The continuous curve of figs. 12 and the dotted curve of fig. 13 resemble each other, the Paltacalo and BOAS' S. Californian skulls having in common a 71, 73 and a still higher 75 elevation, so frequently found also with the groups discussed in my preceding paper. The Lagoa Santa skulls (dotted line fig. 12) only correspond with the dolichocephalic skulls of BOAS' Southern Californian series, but the male Greenland Eskimo skulls again show elevations at 71, 73 and 75. I shall return to the Eskimoes later. First I shall refer to some other groups of skulls which give still more evident curves of the type in question. These groups are mostly South-American ones, especially from the Pacific side, but also from Brazil.

So the Botocudos skulls (fig. 15) give a high elevation at 73 and smaller ones at 71 and 76 reminding of the Indo-Melanesian curves published in our preceding paper.

A very characteristic Nesiot index combination is given by the male skulls from the Peruvian highlands recorded by MAC CURDY, specially by his male Paucarchaucha skulls, registered separately in the combed curve of fig. 16[2]). That several living groups in this part of S. America have corresponding cephalic peaks appears from figs. 20, 21 and 22 in which I registered EHRENREICH's Indians from the Matto Grosso and Amazonas (fig. 20), his Botocudos (fig. 21), HOUZÉ's Paria (fig. 20), the male Quechua recorded by FERRIS (fig. 21), the latter's and NELSON's Cuzco and Apurimac Indians and LEHMANN—NITSCHE's Chiriguanas, Chorotes, Matacos and Tobas (fig. 22).

The Indo-Melanesian character is again very pronounced in the curves of the ancient male and female Patagonian skulls of the Rio Negro district (fig. 18) in which the (71-)73- and 76 and 78 peaks, so characteristic of our Nesiot skull curves again are prominent, though brachycephalic (Araucanian?) admixtures are numerous.

The Fuegian skulls (fig. 19) show a purer Nesiot curve. GUSINDE and LEBZELTER considered the Fuegians as being Australoid. Our curve of male Fuegian skulls with its 73 and 76 peak, however, is very different

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[1]) I am greatly indebted to Prof. SØREN HANSEN, Copenhagen, for sending me the measurements of all the true Lagoa Santa skulls hitherto found.

[2]) LATCHAM's Chilean skulls (fig. 17), though more specialized, probably also belong to this category.

from the male Australian curve in fig. 25 on Table I of our preceding paper, and evidently suggests a relationship with our Indo-Melanesian or Nesiot group [1]).

The 78 peak of the living male Fuegians (continuous line fig. 23) recorded by HYADES and DENIKER, LAHILLE and LEHMANN—NITSCHE equally suggests Indo-Melanesian relationship and so does the female 76 peak (dotted line same figure), occurring also with our female Indo-Melanesians (see our preceding paper Table I fig. 12).

All these curves make it possible and even probable that a people of the same stock as our Nesiot group — so widely spread also among the ancient Polynesians — is represented in South America and the fact that such curves chiefly occur with people from the Pacific coast favours this conception, strongly defended also by KOHLBRUGGE.

In connection with the problem of the origin of the North-American Indians it is worth while to note that similar cephalic curves are found also with several tribes of North-American Indians. So in the curve of the ancient skulls of the Mound dwellers of Ohio, published by BOAS, the 76 peak is by far the highest.

The cephalic curves of the Shoshoneans and Western Ojibwas (fig. 24), those of the Eastern Abenaki and Micmac Indians, of the Pima (fig. 25) and the Delaware and Cree Indians (fig. 26) show the 75—77(8)—80 peak combination. The indicial arrangement of these and several other North-American Indian tribes so closely resembles our Southern paleo-American groups that it raises the question if the theory of the immigration of the North-American Indians via the Aleutian and Behring Straits, which cannot have occurred earlier than at best 10000 years ago, should not be restricted to some tribes only, while others might have developed from more Southern paleo-American groups. For this also the uniformity of the South and North-American Indian bloodgroups and the great serological difference between the North-American Indian and Asiatic Mongolian type might be advanced (cf. Table III).

The Eskimoes.

As stated above, the cranial Eskimo curves (Table I fig. 14) fall in the same category with our paleo-American and other primitive groups. The blood type of the Greenland Eskimoes [2]), however, though resembling the Indian blood type in having a small B, differs from it by a high A by which they closely approach the West Europeans and Australians (Table III).

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[1]) Also the indices of the female and unsexed Fuegian skulls (not registered in my table) are far too high to be Australian.

[2]) Only a small group of Eskimoes of Cape York (ESK. C. Y. Table III) falls in the category of the American Indians, all larger groups of Greenland Eskimoes stand nearer the Nordic European type. Also linguistically a sharp demarcation exists between the Eskimoes and North American Indians.

Undoubtedly the Eskimoes are offshoots of the same primitive stock, once widely spread along the shores of the Pacific and Atlantic.

This also appears from the fact that their index peaks show the same mutations. Whereas the total number of the male cephalic indices of Alaska Eskimoes registered in Table II fig. 9 (continuous line) shows a small 73, a higher 75(6) and a very high 78 elevation, the separately registered indices of HAWKES' male Eskimoes from Point Barrow, Herschel island and Behring straits have prevailing 73 and 75 peaks and only a small 78 elevation.

HAWKES' group comes nearer the cephalic indices of HANSEN's Eastern or Greenland Eskimoes (combed line same figure), the majority of which is dolichocephalic, as also appears from the curve of Greenland Eskimo skulls (combed line, Table I fig. 14) which has its highest elevations at 71 and 73 (corresponding with the 73 and 75 cephalic peaks). Contrarily the Alaska Eskimo skulls (continuous line, Table I, fig. 14) show a small 73, a high 75 and even an additional 78 peak.

Our Eskimo curves clearly show that the indicial relationship of the various Eskimo groups is of the same category as that between the other mesocephalic and dolichocephalic primitives.

It is difficult to say along which way or ways the Eskimoes reached the arctic regions. The facts appearing from UHLENBECK's [1]) studies concerning the Uralic and Indogerman elements in the Eskimo language may perhaps be interpreted as pointing to a Western Asiatic origin. UHLENBECK himself suggests the steppes of Northern and Central Asia. East-Asiatic affinities and migration via the Behring straits are supported by the similarity of paleo-Siberian (fig. 7 and 8) and Alaska Eskimo (fig. 9) curves and by the close resemblance between HAWKES' Eskimo and MONTANDON's male Ainu curve (fig. 6). Ethnological facts also plead for this, as does RUGGLES GATES' test of 16 Alaska Eskimoes [2]).

The difference between the Eastern Asiatic blood type which as far as hitherto examined has a small A and large B, and the Greenland type with its large A and small B and the much closer approach of the Greenlanders to the Mediterrano-Atlantic type (Table III) pleads for European admixture (RUGGLES GATES [2a])).

Yet the ancient character of A (compared with B) emphasized by RUGGLES GATES [3]) suggests that this affinity may be also very ancient. For this the similarity of the Eskimo and Chancelade skull (MORANT) may be advanced. Since the Southern point of Greenland is several degrees more south than Iceland and lies on the same latitude as Oslo and the Faröe, this migration (like early historical migrations from Northern Europe) was quite possible, the more so as it was favoured by sea currents, also responsible for some zoological and botanical dispersions in this direction (SCHARFF).

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[1]) UHLENBECK, Eskimo en Oer-Indogermaansch. Mededeel. der Kon. Akad. v. Wetensch., afd. Letterkunde Deel 77, 1936. I am greatly indebted to prof. UHLENBECK for several enlightening personal communications on this subject.

[2]) RUGGLES GATES: Am. Journ. of phys. Anthr. Vol. **12**, 1929, p. 475; [2a]): Man, 1935 (36).

[3]) Journ. of the Anthr. Inst. Vol. **64**, 1934, p. 23 and Genetica Vol. **18**, 1936, p. 47.

Asia.

Although the most evident representatives of our index type on the Asiatic continent are found in South-East Asia, some more northern groups of Asiatics, who otherwise show considerable differences with the southern primitives, probably may be considered as higher differentiations of the same primitive stock.

The spread of this index stock may be observed West, North and East of the Himalayas, i.e. in Beluchistan and Persia, on the Pamir plateau as well as in North-East and North Asia. To begin with Western Asia (Table II), it is striking to find analogous index relations with Indo-Aryan groups (fig. 1), with the Makhianis of Beluchistan (fig. 2), with the Persians from Isphahan, measured by the KRISCHNERS (fig. 3), the Kurds (combed line, fig. 4) and a group of Pamirese (continuous line same figure) and even with the Tibetans (fig. 5). Although these peoples differ from each other (the Pamirese and Tibetans have pronounced Mongoloid features) and especially from those dealt with in my preceding paper, the similarity of index peaks suggests that they are differentiated from an analogous stock. This is especially striking with the Ainou (fig. 6), whose primitive character has long been recognized.

Also with several paleo-Siberian tribes related index curves occur. With SOMMIER's male Ob-Ostyaks (fig. 7) and with JOCHELSON—BRODSKY's male Tunguse and Yakughirs (fig. 8) the 78 peak is again combined with an 80 peak. Although these Mongoloid-looking peoples differ in many aspects from those mentioned before, the similarity of their index curves is very striking and once more shows the great constancy of this index type. Yet, as first proved by BOAS, the index is not unalterable. I have, however, shown that also its alterations follow a definite rule. For the group of indices we are now dealing with this rule is the possibility of transition of the cephalic 73—75 peak groups into 77(8)—80 groups.

Europe.

The relationship of the 73—75 and 78—80 peaks is not less evident in Europe viz. from both sides of the Mediterranean (Hamites and Mediterraneans proper) to the Atlantic coast. Besides, this index curve may be traced here from the earliest population of these regions up to our times, again showing an increase of the 78—80 cephalic (or 76—78 cranial) peaks in comparison to the 73—75 cephalic (or 71 and 73 cranial) peaks.

This is shown by comparing cranial curves of the paleolithic, neolithic and recent periods of Western Europe. In figs. 10—12 of Table II the constant occurrence of the 73, 76 and 78 peaks in our curves is very striking, but whereas the paleolithic curve (fig. 10) is still complicated by a pronounced 71 peak, while its 76 and especially its 78 peak are lower than the 71 and 73 peak, in the neolithic skull curve of France (fig. 11) the 71 index no more gives a special elevation and the number of 76 and

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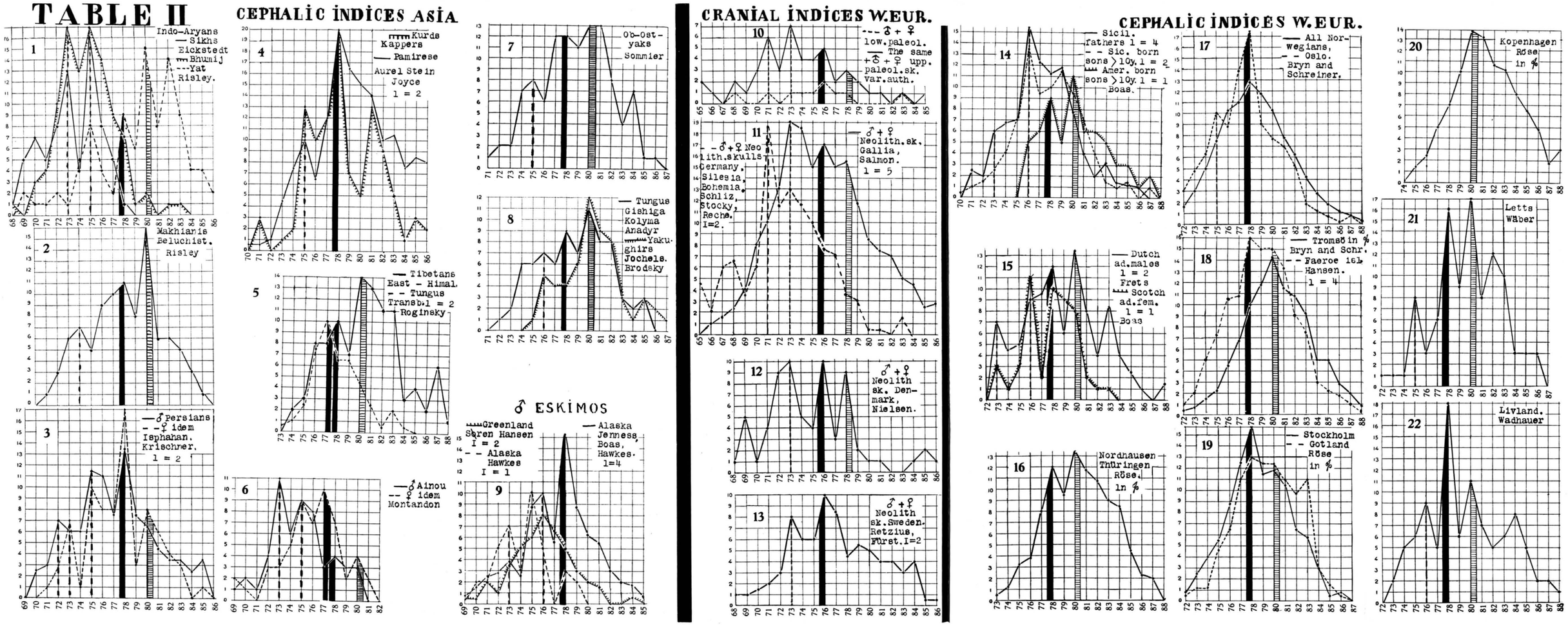
TABLE II



78 indices has relatively increased. In the neolithic Danish curve (fig. 12) the 76 and 78 peaks are about equally high as the 73 peak.

In the neolithic Swedish curve (fig. 13) the 78 index is not outstanding, but the 76 index is higher than the 73. We thus find a relative decrease of the 73 cranial index group especially in northern direction.

The spread of Mediterranean cromlech builders in northern direction along the Atlantic coast being a generally accepted fact, the gradual numerical change in the relative numbers of the skulls in question in northern direction to a prevailing meso-subbrachycephalic type might be advanced in favour of SERGI's opinion that the Nordics (better: Atlantics), notwithstanding their higher index have gradually developed out of Mediterranean groups before the arrival of the Central European Indo-Germans whose skull curve, (dashed line fig. 11) moreover shows far more dolichocephalic indices, and who probably had their cradle land in S. W. Asia, as I tried to prove elsewhere [1]). That cephalic index peaks characteristic of Nordic races (78 and 80) may arise in a Mediterranean group by change of circumstances appears from BOAS' data concerning the Sicilian born and American born sons of Sicilian fathers (and mothers). In fig. 14 I again give the curves showing the prevailing Mediterranean (76) peak with the Sicilian born sons and the characteristic 78 and 80 peaks with the American born sons of the same age group and of the same parents [2]).

In favour of the conception that similar changes may have occurred in the development of our European Nordics (better Atlantics) figs. 15, 17, 21 and 22 may be advanced, showing that with several of our most typical North-European groups peaks of the more primitive 73 and 75(6) cephalic indices still occur in addition to the prevailing 78 and 80 peaks, the only ones in figs. 16, 18, 19 and 20.

While our figures show that analogous index curves occur with such different groups as Austronesians on the one hand and Mediterrano-Atlantics on the other, thus decreasing the importance of the index curve as a radical distinction, they undoubtedly prove that there is a great tenacity in this curve and a definite system in its mutation.

Besides, our conclusion that there is a continuity between the Oceanian races from South America to Indonesia and Southern Asia and the Mediterrano-Nordic races closely agrees with FROBENIUS' conclusion, based upon ethnographic data, especially upon the spread of sun-culture, traces of which are found in a paratropical girdle extending from America via the Pacific and Southern Asia to the Mediterranean and from here north along the Atlantic even beyond England, an ethnographic

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[1]) See An Introduction to the Anthropology of the Near East in ancient and recent times, Amsterdam, 1934, p. 94. See also HERMANN GÜNTERT: Der Ursprung der Germanen, Heidelberg, 1934, p. 62 and WAHLE: Deutsche Vorzeit, 1932.

[2]) GENNA's paper on the population of Trapani (1932) shows that also in this Sicilian town the 78—80 peak type prevails.

continuity confirmed by KOHLBRUGGE on account of the spread of megalolithic monuments.

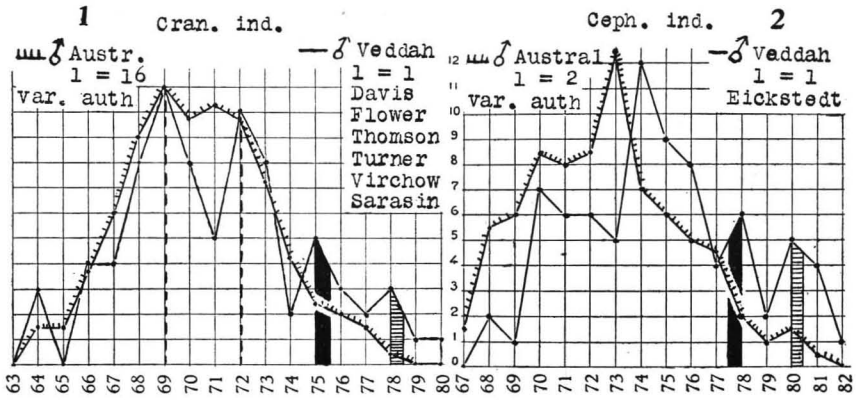
Discussion.

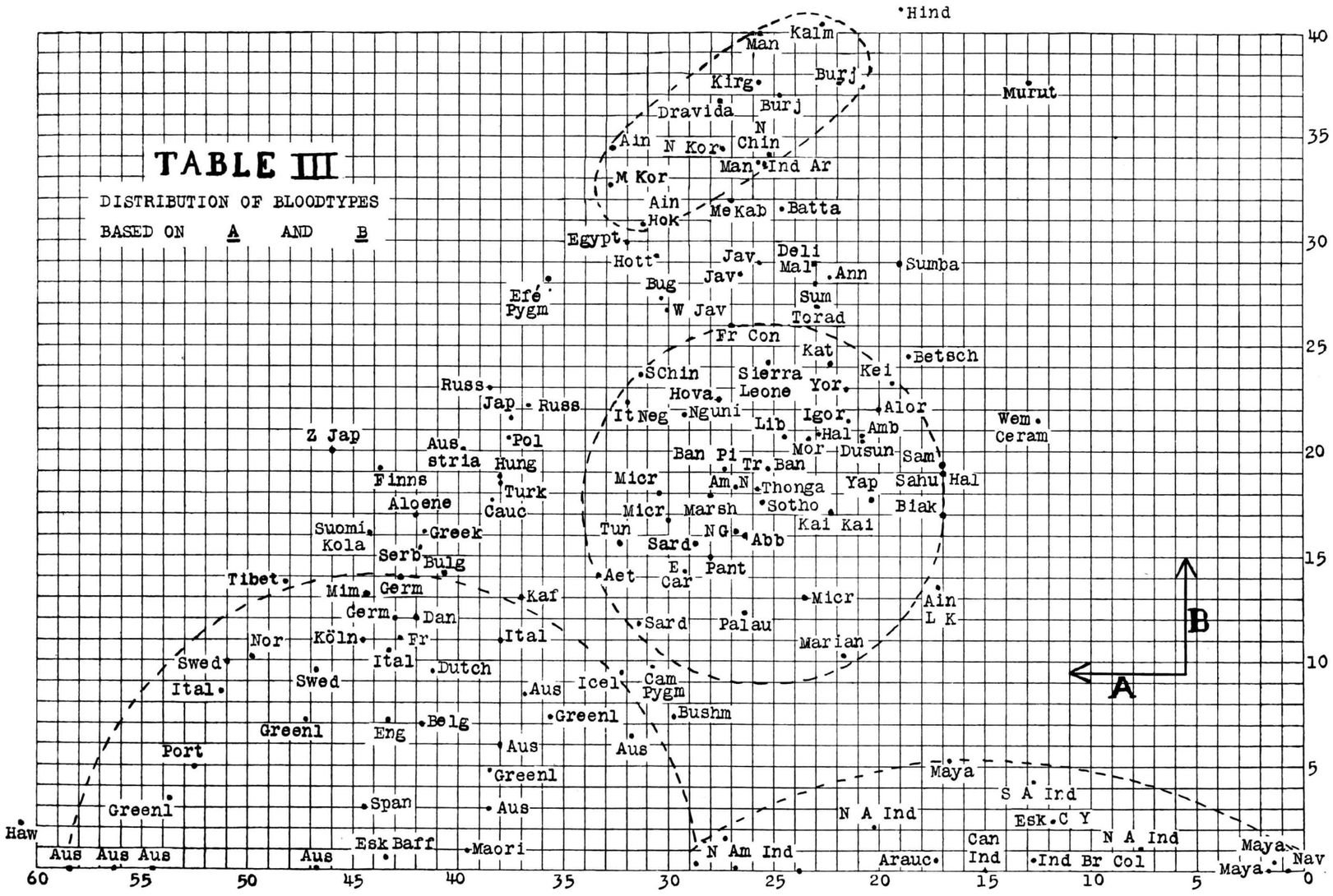
We may briefly discuss the question wether the frequent association of 73—75 and 78—80 index peaks in one group or in closely related groups may be correlated with stature differences or with other factors, e.g. sex.

It is well known that the average index in dolicho-mesocephalic groups usually is about one point higher with the females than with the males. That this also may be expressed in the peaks appears from the Australian cephalic curves added to our preceding paper, the highest male peaks (Table I fig. 10) being at 70 and 73, the highest female peaks (Table I fig. 13) at 71 and 74. The same appears with the Nesiots whose chief male peak is at 75, the female at 76 (ibidem, Table I figs. 1 A and 12).

The sexual difference in curves, however, may be also such that, as with the Ainou (Table II of this paper fig. 6), the female indices partly fall in the higher, i.e. in the meso-subbrachycephalic group, while the male indices fall in the dolichocephalic one. The same, though to a much smaller extent, is observed with our Australian females, which have small additional 78—80 peaks, failing with the males.

However, since females usually have a smaller stature, the differences referred to might be also correlated with stature alone. The correlation of skull index and stature, so well known in animals since KLATT's work on this subject, has been stated also in man, especially by PITTARD and DONICI and by KLEIWEG DE ZWAAN, who found that in closely related individuals of different stature the group with the smallest stature had a higher average index. This might be brought forth in order to explain the greater frequency of the higher indices with the African and New-Guinea Pygmies, where the 77(8)—80 peaks are dominating also in the males. With the Pesechem and Baining the brachycephalisation goes still further, as it also does with the Andamanese and Philippine Negritoes.





Most of the racial or group names on this map speak for themselves. Of some abbreviations the explanation is as follows:

Abb = Abyssinians; Aet = Aeta of the Philippines; Ain Hok = Ainu from Hokkaida; Ain L.K. = Ainu from the Liu Kiu islands; Aloene = Aloene tribe from Ceram (Bijlmer); Am N = American Negroes; Amb = Ambonese (Bijlmer); Ann = Annamites; Aus = Australian groups; Ban Pi = Bantu typed by Pirie; Ban Tr = Bantu from the Transvaal (Pijper); Betsch = Betschuana land; Bug = Bughis (Celebes); Cam-Pygm = Cameroon Pygmies (Julien); Esk Baff = Eskimoes from Baffins land; Esk C.Y. = Eskimoes from Cape York (West Greenland); Fr = French; Fr Con = French Congo; Greenl = Greenland Eskimoes; Hal = Halmaheira; Haw = Hawaians; Igor = Igorotes; Ind Ar = Indo-Aryans; It Neg = Ituri Negroes (Julien); Kat = Katanga Negroes; Lib = Liberian Negroes (Julien); Kei = Kei islanders; Man = Manchu; M Kor = Middle Koreans; Me Kab = Menang Kabau; Marsh = Marshall islanders; Mim = Mimika Papuans (Bijlmer); Mor = Moroccans; N G = New Guineans (Heydon and Murphey); Pant = Pantarese (Bijlmer); Sahu Hal = Sahu tribe on Halmaheira (Bijlmer); Sam = Samoans (Stephenson); Sard = Sardinians; Sum = Sumatrans; Torad = Toradjas; Tun = Tunesians; Wem Ceram = Wemale tribe from Ceram (Bijlmer); Yor = Yoruba Negroes. —

The Nguni, Thunga and Sotho, typed by Elsdon-Dew, are Bantu tribes, the Murut and Dusun Borneo Dayaks, typed by RIDE. For more data see WELLISCH' and STEFFAN's Handbuch der Blutgruppenkunde, Lehmann, München, 1932. —

Even the prevailingly dolichocephalic dwarfish Veddah from Ceylon (average male stature 153 cm.) differ from their closest relatives, the Australian aboriginals with whom the main body of their male cranial indices (textfig. 1) corresponds, by having an additional 75 and 78 cranial peak, a phenomenon equally observed on comparing the cephalic curves of both groups [1]), registered in textfigure 2. However, the fact that the majority of the Veddah are dolichocephalic, and — on the other hand — the frequent occurrence of 77(8)—80 cephalic (75(6)—78 cranial) peaks in much taller tribes in Africa as well as in Oceania, shows that the meso-sub-brachycephalic variation, though favoured by small stature, is by no means always correlated with it. Apparently also other factors act a part in the increase of the index, among which probably also the increase of the brain, since there is evidence to show that the 78—80 index usually is combined with a greater skull capacity than the lower indices (BOLK, DIJKSTRA, PICKERING [2])).

Another point is the relation between the so frequently occurring central Eurasian 79—81 cephalic peak curve and the 78—80 peak cephalic curve. Although the difference between these peaks is one point only, the frequent occurrence of the 79—81 peaks in curves of more central Eurasian peoples and their very rare occurrence in the curves of African, Oceanean and Atlantic-Nordic peoples suggests that, apart from other anthropological differences there may be special factors producing the 79—81 index peak curve.

In this connection I may again refer to the fact that, wherever 78—80 peaks are found on the Eurasian continent, either with Mongoloid or with non-Mongoloid groups, among these groups frequently a good number of the more primitive 73—75(6) index type is found. On the contrary the Eurasian 79—81 index groups, published in another paper [3]), very rarely show a combination with the more primitive 73—75(6) peaks.

The less primitive character of the 79—81 index curve also appears from the fact that the 79—81 curves often show additional brachycephalic, viz. 83 and 86 peaks.

That this may lead to prevailing 83—86 index peaks, which also may revert again in the 79—81 peak type, was shown in preceding papers [4]) on the ground of the data published by BOAS, GUTHE and HIRSCH. In this connection also KLEIN's researches on the developmental changes of this index are important [5]).

SUMMARY [6]).

Frequency curves of cephalic and cranial indices of Nesiots and Melanesians show that their prevailing index peaks correspond with those of the African Melanoderms, viz. the 73—75 and 77(8)—80 cephalic or the 71—73 and 75(6)—78 cranial peaks. The middle circle in Table III shows the same for the majority of their blood groups.

With both the African and Oceanian Melanoderms Pygmy variaties occur with 77(8)—80 peaks, but with both also taller people with

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[1]) I am greatly indebted to prof. E. VON EICKSTEDT for giving me the individual data of his important Veddah measurements.

[2]) Amer. Journ. of physical Anthropology, Vol. **15**, 1930.

[3]) Proc. Royal Acad. Amsterdam, **37**, 602 (1934).

[4]) Proc. Royal Acad. Amsterdam, **38**, 686 (1935) and Ibidem p. 989.

[5]) Proc. Royal Acad. Amsterdam, **38**, 1021 (1935).

[6]) Of this and our preceding article (Volume **39**, p. 1156).

prevailing 77(8)—80 peaks occur. With the Pesechem and Baining Pygmies a further brachycephalisation takes place.

While the wide spread of the 75 cephalic (73 cranial) peak groups shows their great viability, the frequent combination of the 75 with the 77(8)—80 peak type indicates their inherent progressive tendency. On the other hand, the far more localized "Australoid" 73 cephalic (71 cranial) and its usual combination with much lower index peaks indicates a more or less asthenic, regressive character of these groups.

Indo-Melanesoid index curves are also found in the Polynesian islands (with the more ancient population chiefly) and furthermore in Southern California, Ecuador, Peru, Brazil, with the Patagonians, Fuegians and several North American Indian groups, thus showing that a primitive 75—77(8)—80 index people — now differentiated in various sub-races — has extended over the whole earth in its greatest intertropical width.

On the Asiatic continent analogous frequency curves are found with the Melanoderm Dravidians (an Australoid curve with the Veddah) but also with the non-prognathous, depigmented and further differentiated Indo-Aryans, Makhiani, Persians, Kurds and Ainou and with paleo-mongoloid South Eastern Asiatics such as the Shan, Palaung, Pamirese, and Tibetans, the paleo-Siberian Ob-Ostyaks and Yakughirs.

The Eskimoes also show primitive index curves. The relationship between the Western and Eastern groups is such that with the Greenland Eskimoes the more primitive dolichocephalic peak prevails, with the Alaska Eskimoes its more progressive mutation (78; cf. Table II, fig. 9). This relationship is still more evident in the cranial curves (Table I, fig. 14). — The resemblance of the Alaska curves and the paleo-Siberian and Ainou curves suggests East Asiatic affinities. The blood type of the Greenland Eskimoes (Table III) closely approaching the Mediterrano-Atlantic blood type raises the question if their European relationship (RUGGLES GATES) may not be of a very ancient date, as suggested by the Chancelade skull.

A comparison of the paleolithic, neolithic and recent Mediterrano-Atlantic groups of Western Europe shows that the 76—78 cranial (= 78—80 cephalic) group increased in the course of time and especially in northern direction at the expense of the 71—73 cranial (73—75 cephalic) group. This as well as the occasional occurrence of 73—75 peaks with the 77(8)—80 Nordic peaks strongly suggests that the meso-sub-brachycephalic group may be partly a mutation of the 73—75 cephalic group.

The anthropological relationship established between the Pacific, southern Asiatic and Mediterrano-Atlantic (Nordic) groups agrees with FROBENIUS' [1]) and KOHLBRUGGE's ethnographic conclusions (Table IV). Our results strongly plead for a monophyletic origin of humanity [2]).

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[1]) FROBENIUS, Vom Kulturreich des Festlandes, München-Nymphenburg, 1923.

[2]) Space does not allow to quote the extensive literature consulted for the data registered in our curves. The authors, however, are mentioned on the figures.

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