# A Reappraisal of Recent Serological, Genetic and Morphological Research on the Taxonomy of the Races of Africa and Asia

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During the past fifteen years a large number of serological-genetical studies have been carried out among many populations in Africa and Asia. Many interesting facts on the distribution of ABO, MNS, Lutheran, Henshaw, Rh, Duffy and Kelly blood groups have been discovered. It has been maintained by many researchers in this field that these distributions are of great physical anthropological significance. During this fifteen-year period, a remarkable volume of reports has been published on the distributions of the various abnormal haemoglobins such as sickle cell trait, haemoglobin C, D, etc., thalassaemia, and Cooley's anaemia. It has also been asserted that the gene frequency distributions of these abnormal haemoglobins are of singular anthropological importance. It is scientifically unimportant that the data involved here are mostly blood factors; the important relevant factor in this regard is in the field of human genetics. The fundamental split in physical anthropological methodology which this blood group trend indicates, is an interest and concern with man's genotype rather than phenotype.

The proponents of the genotypical-serological school have stated eloquently and repeatedly that phenotypic studies have already been done during the past sixty years in sufficient number to warrant their termination. On the other hand, these investigators maintain that genotypical studies have not been pursued with the same zeal so that, as a result, there are large gaps in the knowledge of man's genetic nature. To these scientists phenotype, or the apparent appearance of a biological specimen, gives very little information as to the true nature of that specimen, since its appearance is modified by its environment. What is considered crucial from their point of view is the genetic potential that exists within this specimen and the mathematical reconstruction of the frequencies of the various genetic potentials, if possible, in the population whence the specimen comes. The units responsible for these various genetic potentials are called genes and can be visualized as so many pearls on a string, known as chromosomes.

The proponents of the more recent genetical method hold the view that the frequency distribution of various blood group genes within a population are of greater taxonomic value in distinguishing populations from each other, than the so-called descriptive, phenotypic, morphological, morphometric traits of the earlier scientists.

Another criticism made of the phenotypic school is that it was too frequently concerned with the products of evolution rather than the process of evolution (Washburn, 1951). This, they maintain, is now to be remedied, since the effects of natural selection and other important evolutionary processes can be grappled with effectively with the techniques of population genetics. It might be more interesting if they be allowed to speak for themselves in these matters. During the past ten years one of the most important figures representing the blood group cause is Professor Boyd, who on more than one occasion has been very outspoken on his theoretical interests in physical anthropology. For example in 1951 at the Seventh Annual Founders Lecture, Medico-Chirurgical Society of the District of Columbia, reprinted in the Yearbook of Physical Anthropology, 1952, he stated

> Races are evolved by the forces of evolution acting upon the genes in a population. Races may be distinguished by the varying distribution of various genes in the populations.
>
> There seems to be four main agencies which act to modify the gene frequencies of human populations, and thus evolve races different from those with which we started.
>
> One is the *mixture* of population which may be homogeneous or may possess different frequencies of certain genes. The arithmetic of

gene mixture has been discussed in a number of admirable papers and books. In some cases, where one population is expanding more rapidly than the other, there may exist an immigration pressure tending to push a new gene into a population that does not have it, or has relatively little of it.

Mixtures of populations which until recently were thought to differ so radically as to consistute a different species may have occurred in the past, and there is considerable reason to think that mixture between Neanderthal man and Homo sapiens occurred before the total disappearance of Neanderthal man. The present-day Homo sapiens may well possess a number of genes acquired from Neanderthaloid ancestors.

The second agency which may change the gene frequency in a population is *mutation,* which is usually the production of a new gene by the sudden change of an old gene. For most genes, this occurs with a fairly regular frequency, but it is never possible to predict in what individual it will occur. It is of course known that agencies such as radiation, colchicine, the nitrogen mustards, and certain carcinogens, may cause mutations to occur at a higher rate than is observed in natural populations.

The third agency which may alter the frequency of a gene is *natural selection,* the importance of which was brought out fully for the first time by Darwin in his great book on the *Origin of Species.* At one time not too many years ago, physical anthropologists hoped to be able to classify mankind on the basis of non-adaptive characteristics, that is, characters which were not subject to the action of natural selection. It now seems very unlikely that any such characters exist. The mere fact that numbers of individuals possess a character is an indication that it is, at least under certain circumstances, an advantage.

The fourth agency which alters gene frequency in populations is the phenomenon of genetic or random drift, or as Sewall Wright, who has studied it so extensively calls it, *random variation.* Briefly, this consists of the fact that in a small population the new generation may purely by accident not possess one or more of the genes possessed by the parent generation, or may contain them in diminished frequency. As long as the frequency does not reach zero or one (that is, one of the genes is not completely lost), random variation may again restore the same gene frequencies already present, but once the gene frequency reaches zero, something irreversible has happened: that gene has been lost forever to that population, unless it be re-introduced by mutation, or by migration and crossing. Wright has been able to show mathematically that this agency is much more important in evolution than would have been suspected from armchair speculations.

Exactly how many races we distinguish will be up to us. Taxomony is the work of man, and not of nature, and it is entirely a

> matter of expediency whether within a given species we distinguish one race, six races, or thirty races; and whether or not any of these thirty races agree with any of the six may not prove that either of these methods is wrong or that either has much advantage over the other.
>
> Having long ben interested in genetics as a result of work on the blood groups and their mode of inheritance, I have proposed a tentative classification of races based on gene frequencies. It differs but little from that proposed somewhat earlier by A.S. Wiener. Since both classifications make use chiefly of blood grouping characteristics, however, it is not surprising that they should be somewhat similar.

Spuhler's point of view is somewhat less extreme in regard to these matters. He states that

> Differences in genetic characters between human breeding populations may be catalogued in terms of differences in gene frequencies. Statistical models are available to explain change in gene frequency. In theory the process of race formation can be reduced to a single concept — change in gene frequency. Theoretically, then, population genetics provides a method for studying the relationship between, and the history of, contemporary or recently extinct populations. Empirical application of this method presupposes knowledge of a number of characters controlled by simple genotype systems showing fairly constant expressivity and nearly complete penetrance in the range of environments characteristic for human societies. Serology furnishes the best candidates for characters of this sort. Because of limitations in the application of serological techniques (for example to the vast body of data already available from the world's dissecting rooms, and from field observations by physical anthropologists), and the security provided by ever more characters employed in analysis, genetic knowledge on other widely-distributed characters, especially normal morphological variations, is required to supplement, and in some cases to substitute for, the serological data. (Spuhler, 1950)

From the above it is quite clear that Boyd's and his school's chief scientific interest is the observation of the gene frequency distribution of monogenetic-serological features. By monogenetic we mean that the biological result is determined by a single pair of alleles. This means that the mode of inheritance is that of a simple Mendelian ratio 1:2:1. Professor Boyd does not tackle the problem of polygenic features since, he states, their mode of inheritance is as yet not understood.

The biological characteristics in humans which have a monogenetic mode of inheritance are the various blood groups, the various abnormal haemoglobins, and several inherited pathologies such as brachydactylism, lobster claw, chondrodystrophy, etc. It seems rather strange that the choice of characteristics to distinguish between races is made on the basis of whether or not they have a simple mode of inheritance so that their gene frequency can be computed. Nowhere has Professor Boyd posed the question as to whether or not the characteristics he is chosing are taxonomically relevant. To put it in one phrase: *monogenic serological factors do not ispo facto have racial-taxonomic value.* Unfortunately for Professor Boyd it is the polygenic features such as skin colour, hair texture, nose shape, lip thickness, which have the greatest taxonomic value. And why is it necessary to understand the mechanism of inheritance if one is concerned with the question of distinguishing between the various racial groups which, Professor Boyd states, is one of the chief aims of physical anthropology?

There are several other inherent inconsistencies in his system. In his book *Genetics and the Races of Man* (1950), he reconstructs the racial history of Africa, Asia, Australia and the New World on the basis of the gene frequency distribution of the various blood groups. However, as we have seen in the above quotation, he points out that these gene frequencies are subject to change due to hybridization, mutation, natural selection and random variation of genetic drift. All geneticists agree that in small populations, the last-mentioned factor, namely genetic drift, can be the cause of rather rapid changes in gene frequencies. If this be true, how then can Professor Boyd construct the racial history of the world on the basis of gene frequencies which are known to be variable due to the above-mentioned processes causing change? This is the reason 'par excellence' why the serological genetical system in racial taxonomy is even more inconsistent and logically untenable than the phenotypical methodology. Weidenreich as long ago as 1946 and Hooton in 1956 very clearly expressed their dissatisfaction with Boyd's views. These criticisms have been so flagrantly ignored that the relatively complete citation below is justified. In Chapter IV of his book *Apes, Giants and Man,* Weidenreich states,

> Since there is no correlation between racial characters (such as have been used by the anthropologists) and blood qualities, and in

addition, since an anthropological race is not determinable by one such character alone, the anthropologists were right in neglecting the serological criteria. All the more so since their system is based on the principle of the geographical restriction of the racial characters. However, the distribution of the blood qualities, as it is today and as it is supposed to have been in the past, gives no convincing evidence of a strictly geographical distribution, despite all claims of the serologists to the contrary. Charts have been constructed by the serologists to show the routes along which blood qualities have spread over the globe. Of course, blood qualities must have travelled, for man, their bearer, has travelled; but in which special race-disguises the qualities were concealed, it is impossible to determine, simply because there is no strict correlation between race and blood group, as stressed by the serologists themselves. Boyd, who is fully aware of these difficulties, confines the real anthropological worth of the blood qualities to their fitness as a guide through the maze of racial history, particularly in regard to early mankind. But even with this reservation, morphological features, as they have been preserved in the skeleton, are certainly more elucidative for this purpose.

Relation between Blood Quality and Hair Color,
Tested on 1,152 Individuals
(In Percentage)

| Hair Color | A | B | AB | O |
|---|---|---|---|---|
| Blond | 44.2 | 8.6 | 2.3 | 44.9 |
| Brown | 42.0 | 9.6 | 3.0 | 45.4 |
| Black | 44.5 | 7.8 | 3.6 | 44.1 |

It has been shown that the apes — particularly the anthropoids — possess, in principle, the same blood groups as man. This being so, the quality of the blood must be of very ancient character, and therefore, a very old heritage. The distribution through mankind may have occurred long before the morphological characters chosen for the anthropological classification of today were developed.

Should, however, anthropologists yield to the demands of the seroanthropologists and accept the blood qualities as essential criteria for the classification of modern mankind, there is no other way of incorporating them in the anthropological system than to subdivide each of the acknowledged racial groups according to the special blood qualities recognizable in them. But if this were done, a new difficulty would arise. In late years, additional blood qualities have been discovered. The group A itself has been subdivided into four subgroups; and new groups have been added to the already existing list, namely

Frequencies of the Blood Groups: O, A, B, and AB

| Populations | O | A | B | AB |
|---|---|---|---|---|
| Eskimos | 80.7 | 12.9 | 2.4 | 4.0 |
| Argentines | 59.0 | 28.0 | 18.0 | 2.0 |
| Bantu Negroes | 53.2 | 18.6 | 24.5 | 3.6 |
| Giliaks | 50.0 | 27.4 | 14.5 | 8.0 |
| Germans (Eifel) | 46.5 | 44.8 | 5.2 | 3.5 |
| Germans (Baden) | 38.1 | 48.1 | 10.9 | 2.9 |
| Dravidians | 24.3 | 27.5 | 36.8 | 11.4 |
| Egyptians | 24.0 | 32.0 | 30.0 | 14.0 |
| Koreans | 17.9 | 36.6 | 33.7 | 12.5 |
| North American Indians | 91.3 | 7.7 | 1.0 | 0.0 |
| Australians | 55.0 | 38.0 | 5.9 | 1.1 |
| Negroes (Congo) | 45.6 | 22.2 | 24.2 | 8.0 |
| Swedes | 43.0 | 42.0 | 8.0 | 7.0 |
| Ainu | 11.6 | 29.3 | 34.1 | 25.0 |

the groups $M_1$ and $M_2$, $N_1$ and $N_2$ and Rh, etc. Not less than 2,560 kinds of human blood are now serologically distinguishable. It is not known, so far, whether and in what frequency all these groups are distributed over the populations of the earth. Should all of them occur in all thirty-eight anthropologically distinct races and subraces, we would have 92,780 different racial groups — not including the "constitutional" types and their combination with the "anthropological" and serological ones. The main qualities of all these groups would agree with the demands of geneticists and serologists.

## Hooton maintains in his book *Up From the Ape*

In spite of the accurate knowledge we possess of the genetics of various blood group substances, their control by very few genes, their allegedly "non-adaptive" character, their permanence in the individual, and their supposed independence of environment, we can hardly discard the ordinary anthropological criteria of race in favor of serology. The reconstructions of primitive races and prehistoric migrations that are based upon serology (at least as respects the standard blood groups) are even more speculative and implausible than those that result from the study of skulls and bones. And, as regards contemporary man, I am afraid that scientists, together with the entire lay population of *Homo sapiens*, will persist in distinguishing Negroes, Mongoloids, and White by observing their visible and distinctive morphological combinations rather than by depending upon serological tests. We shall continue to call a gorilla a gorilla and a chimpanzee a chimpanzee, even if they belong to the same blood group.

Similar Blood Group Frequencies in Physically Diverse Peoples

| People | Place | Gene Frequency<br>$p$ | $q$ | $r$ |
|---|---|---|---|---|
| Eskimo | Labrador, Baffin Land | .318 | 0 | .682 |
| Aborigines | W. Australia | .306 | 0 | .694 |
| Pygmies | Ituri River, Belgian Congo | .227 | .219 | .554 |
| Russians | Perm | .231 | .203 | .573 |
| Iranians | Persia | .237 | .235 | .553 |
| Zulu | South Africa | .157 | .122 | .730 |
| Berbers | Tunis | .159 | .127 | .707 |
| Whites | Agnew, Cal. | .172 | .105 | .733 |
| Melanesians | N.E. Pantari Is. | .173 | .108 | .723 |
| Buriats | Mongolia | .158 | .264 | .578 |
| Bambarra | W. Sudan | .180 | .225 | .598 |
| Hindus | United Provinces | .190 | .272 | .550 |
| Manchu | Mukden | .198 | .249 | .556 |
| Orochi | Saghalien, Japan | .190 | .270 | .552 |
| Gypsies | Puspokladany, Hungary | .178 | .265 | .573 |
| Armenians | Tiflis | .334 | .112 | .559 |
| Micronesians | Kusaie, Carolines | .300 | .125 | .585 |
| Egyptians | Alexandria | .338 | .116 | .553 |

In November 1955, Professor Boyd recanted his views at the American Anthropological Association meetings in Boston. He stated that he was wrong, but not for the reasons that have been mentioned above. The reasons he gave were that the ABO blood groups which he had thought were non-adaptive features, in other words, unmodifiable by the environment, were found to be correlated with certain diseases. Buettner-Janusch makes the following interesting remarks on this subject.

> Despite the widespread belief among anthropologists and others in the usefulness of nonadaptive traits and neutral genes in classifying human populations and working out the course of human evolution, it has been difficult to defend the concept of a neutral gene since 1930 when Fisher published "The Genetical Theory of Natural Selection." Boyd (1953) pointed out what difficulties this point of view made for physical anthropology. That the associations noted above between blood groups and disease may be due to ethnic stratifi-

> cation in the samples tested is, of course, a necessary caution when one is working with large samples drawn from populations of mixed origin. This point can be, and has been, overemphasized (Wiener, 1943; Wiener and Wexler, 1956). In the study by Clarke and his associates already cited, some care was taken to show that in the association between duodenal ulcers and group O the stratification argument cannot possibly hold, and similar considerations apply to the cases of the relation of group A to stomach carcinoma, diabetes mellitus, and pernicious anemia. It is worth noting in detail the three points Clarke makes. First, the original population susceptible to ulceration must have a group O frequency larger than 60 percent. No such group has been reported from the continent of Europe. Second, the association has been found in a number of European countries. Third, the association between blood type A and gastric carcinoma implies, according to the ethnic argument, a second stratification in Great Britain, and one which runs in an opposite direction to the geographical incidence of the disease. We should counter with the question, all right, where did the original ethnic differences in blood group frequencies come from? It is time to turn the question around in this way and search for the reasons for ethnic, population, and even village differences such as Ceppellini showed (1955). (Buettner-Janusch, 1959)

Let us examine some of the serological data, gathered in Africa by qualified haemotologists for the purpose of explaining

The Distribution of Non-Metrical Features in Some Negro and Negroid Races of Africa

| Race | Hair Texture | Hair Colour | Eye Colour | Skin Colour |
|---|---|---|---|---|
| Hamitomorph | curly to frizzly | black | light brown to dark brown | light brown to dark brown |
| Nilohamitomorph | frizzly | black | dark brown | dark brown to black |
| Bantomorph | frizzly | black | light brown to dark brown | light brown to black |
| Nilotomorph | frizzly | black | dark brown | black |
| Congomorph | frizzly | black | dark brown | light brown to black |
| East African Mulattomorph | curly to frizzly | black | light brown to dark brown | light brown to dark brown |
| Nigeromorph | frizzly | black | dark brown | dark brown to black |

(East and Oschinsky, 1958)

The Distribution of Metrical Features in Some Negro and Negroid Races of Africa

| Race | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Hamitomorph | tall | small | long | long | medium | Dolichocephalic | Leptorrhine to mesorrhine | thick |
| Nilohamitomorph | tall | small | long | long | high | Dolichocephalic | Meso- to platyrrhine | thick |
| Bantomorph | medium | medium | medium | medium | medium | Dolicho- to mesocephalic | Platyrrhine | thick |
| Nilotomorph | tall | small | medium to long | long | high | Dolicho- to mesocephalic | Platyrrhine | very thick |
| Congomorph | medium to short | large | short | short | low | Meso- to brachycephalic | Platyrrhine | thick |
| East African Mulattomorph | variable | large | short to medium | short to medium | medium | Meso- to brachycephalic | Mesorrhine | medium |
| Nigeromorph | medium | medium | — | — | high | Mesocephalic | Platyrrhine | thick |

Key: (1) Stature; (2) Sitting Height relative to Stature; (3) Total Upper Extremity Length relative to Sitting Trunk Height; (4) Total Lower Extremity Length relative to Sitting Trunk Height; (5) Forearm Length relative to Upper Arm Length; (6) Head Breadth relative to Head Length; (7) Nose Breadth relative to Nose Height; (8) Lip Thickness.

(East and Oschinsky, 1958)

some rather remarkable anthropo-geographical problems, centering around the origin and the differentiation of various Negro sub-races. The Negro stock, or 'la grande race négroïde' exhibits many interesting local geographical varieties, as is also the case among caucasoids and mongoloids. [see tables above]

The tall, lean, thick-lipped, very broad-nosed Nilotomorphs with their coal-black skins and long extremities, represent one extreme in the typological range of variation in contrast to the little pygmies, characterized by extremely short stature, short extremities, thin lips, light-brown skin and peppercorn hair distribution. Between these two typological extremes in Negro variation are the Hamitomorphs, Bantomorphs, etc., whose morphological features can be read in the above table. Some of the old problems which morphological-morphometrical methods attempted to solve and which serology has taken on, are the following:

1) Are the Nilotomorphs and the Congomorphs the primordial Negroes since typologically they have the blackest skin, the thickest lips, the broadest noses, and the highest degree of prognathism?
2) Are the Hamitomorphs and the Bantomorphs intermediate types in a Negro evolutionary sequence, or are they ancient hybrids between the Caucasoids and Negroids?
3) Are the recent Negro-White hybrids or Mulattomorphs found in Zanzibar and on the East African coast similar biologically to the ancient hybrids?

Among the most important of the recent serological studies in this field is that of Lehmann and Raper. They found an inverse relationship between sickle cell trait and Hamitomorphic biological admixture, and drew the following conclusions from their data

> ...We wish to do no more than indicate how our results bear on physical anthropology. The incidence of the sickle-cell trait is uniformly low in the pastoral, Hamitic-tongued tribes, with the single exception of the Teso.
>
> The Nilotic tribes... are remarkably homogeneous with regard to sicklaemia, excepting only the Madi...
>
> Unlike the two previous groups, a wide variation is seen among the Bantu tribes. The incidence of sicklaemia appears to be inversely

proportional to the contact the various tribes have had with their most recent Hamitic invaders. Thus the trait is least common among the Bairu, who have lived for generations as helots to the ruling class of Hamitic conquerors, the Bahima, on the best pastoral land in Uganda. Next come the Banyaruanda, Banyora and Batoro, whose traditions and customs testify to prolonged contact with the Bahima, and whose aristocracy possesses Hamitic features. The contact of the Baganda, Bakonjo and Barundi with Hamitic peoples in recent times has probably been less direct and made by way of their neighbours, the Banyoro, Batoro and Banyaruanda.

Distribution of Sicklaemia in Uganda

| Language Group | Tribe | Number Examined | % of Sicklaemia |
|---|---|---|---|
| | Bahima* | 166 | 2.4 |
| HAMITIC | Sebie | 124 | 0.8 |
| | Suk | 128 | 3.9 |
| | Karamojong | 156 | 3.2 |
| | Teso | 416 | 17.8 |
| | Lango | 278 | 27 |
| | Acholi | 141 | 27 |
| | Jaluo (Luo) | 130 | 28 |
| NILOTIC | Lugbara (Lubgwara) | 120 | 21 |
| | Kakwa | 101 | 25 |
| | Alur | 114 | 25 |
| | Jonam | 109 | 26 |
| | Madi | 109 | 3 |
| | Bairu (Bahiru) | 139 | 2 |
| | Banyaruanda (Bahutu) | 496 | 8 |
| | Banyoro | 91 | 12 |
| | Batoro | 120 | 12.5 |
| | Baganda | 740 | 19 |
| BANTU | Bakonjo | 102 | 18 |
| | Barundi | 108 | 19 |
| | Bakenyi | 88 | 26 |
| | Basoga | 241 | 29 |
| | Bagishu | 207 | 30 |
| | Baamba | 140 | 45 |

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* Although the Bahima now speak the Bantu language of their subjects, they have — for obvious reasons — been included in the Hamitic group.

> The Basoga and Bagishu, two closely-related tribes, live remote from the track of the Hamitic peoples. The South Basoga to whom the accompanying table refers, live in the swampy country between Lakes Victoria and Kyoga. The Bagishu live on the western slopes of Mount Elgon. There is no history of direct contact with Hamitic tribes, though tradition records hostile relations with the Jaluo of the neighbouring plains, themselves a tribe of high sickle-cell incidence.
>
> The Baamba are a secluded tribe living west of the Ruwenzori Range. They are composed of the Babullibulli and Bamwezi, who differ in language and in some physical characteristics, but show the same incidence of sicklaemia. They claim to be autochthonous, and of all the tribes we have investigated these pigmoids are furthest removed from the Bahima in physical appearance." (Lehmann and Raper, 1949)

Allison *et al.* make the following claims on the basis of the gene frequency distributions of the various blood group systems

Collected Gene Frequencies: Kenya

| | Kikuyu | Luo | Mixed Series: Luo & Kikuyu | Massai |
|---|---|---|---|---|
| O | 0.6882 | 0.6881 | 0.7145 | 0.7095 |
| $A_1$ | 0.1113 | 0.1127 | 0.1077 | 0.1148 |
| $A_2$ | 0.0661 | 0.0362 | 0.0435 | |
| B | 0.1343 | 0.1629 | 0.1342 | 0.1756 |
| MS | 0.2088 | 0.1010 | 0.1642 | |
| Ms | 0.3799 | 0.4068 | 0.3619 | |
| NS | 0.0841 | 0.1285 | 0.1124 | |
| Ns | 0.3272 | 0.3637 | 0.3614 | |
| $R_1$ CDe | 0.0654 | — | 0.0730 | |
| $R_2$ cDE | 0.0645 | — | 0.0992 | |
| $R_0$ cDe | 0.6159 | 0.8174 | 0.5550 | |
| $R^u_0$ cD$^u$e | 0.0942 | 0.0474 | 0.0399 | |
| r cde | 0.1287 | 0.0415 | 0.2045 | |
| R′ Cde | 0.313 | 0.0469 | 0.0142 | |
| R″ cdE | — | 0.0469 | 0.0142 | |

> The blood groups of the Amba (Baamba) therefore do not show such a difference from those of their neighbours as was expected when their study was undertaken. The difference between them and the Kikuyu (Akikuyu) and Luo is not appreciably greater than the difference between the latter two tribes.
>
> Taking all blood group systems into consideration, it is surprising how slight are the differences between the Nilotic Luo and the Eastern Bantu Kikuyu. From the present study and the results of Elsdon-Dew (1939) the tentative conclusion can be drawn that the East African native population (apart from the Massai and other Hamitic tribes) is on the whole fairly uniform. (Allison *et al.,* 1952)

The above quotation is an example of the kind of unwarranted generalization based upon a few characters which is all too frequently met with in the reports of some of the serologists. As the writer has already pointed out in 1954,

> The blood group distribution of 5,000 East African Bantomorphs (Elsdon-Dew, 1939) and 808 South African Bantomorphs (Pijper in Wiener, 1948) are extremely uniform. In East Africa among the various Negro races the situation is rather complex. The Hamitomorphic Bahima and the Bantomorphic Baganda have practically the same blood group gene distribution. The Bantomorphic Akikuyu of Kenya, when compared with the Baganda who are anthropometrically similar, have distributions which are more different than one would expect within groups belonging to the same race. As already has been mentioned above, the Nilotomorphic Luo and Lango have a rather similar blood group gene distribution to that of the Congomorphic Baamba.
>
> Since the intra-racial blood group distributions of the East African Bantomorphs seem to be heterogeneous and the inter-racial blood group distributions in many cases are homogenous, one has little choice but to conclude that the blood group data alone are insufficient as sole criteria of racial differences in East Africa.

and again in 1958,

> Distribution of the Percentage Sicklaemia and Blood Group Genes of the Various East African Racial Groups according to Lehmann and Raper (1949), Elsdon-Dew (1950), Allison *et al.* (1952), and Hiernaux (1954)

| Racial group | Tribe | Sicklaemia | Blood Group Genes<br>A | B | O |
|---|---|---|---|---|---|
| Hamitomorph | Bahima | 2.4 | 11.3 | 7.1 | 81.3 |
| | Batutsi | 1.4 | 12.6 | 5.6 | 81.7 |
| Bantomorph | Baganda | 19.0 | 10.2 | 6.6 | 82.9 |
| | Bahutu (Uganda) | 8.0 | — | — | — |
| | (Ruanda) | 5.2 | 17.4 | 13.7 | 68.7 |
| | (Urundi) | 11.8 | 17.4 | 13.7 | 68.7 |
| | Akukuyu | — | 17.7 | 13.4 | 68.8 |
| Nilotomorph | Luo | 28.0 | 14.9 | 16.3 | 68.8 |
| | Lango | 27.0 | 16.3 | 17.1 | 64.1 |
| Nilohamitomorph | Massai | — | 11.5 | 17.6 | 71.0 |
| | Teso | 17.8 | 13.4 | 13.0 | 72.2 |
| Congomorph | Baamba | 45.0 | 18.1 | 12.8 | 69.1 |

Hiernaux (1954) found that the Rhesus-factor incidence in both the Hamitomorphic Batutsi and Bantomorphic Bahutu showed no significant difference. The same author also discovered that the incidence of sicklaemia in the Ruanda Bahutu was less than half of that of the metrically very similar Urundi Bahutu.

Rhesus Factor Incidence in the Batutsi and Bahutu Tribes

| Factor | Batutsi | Bahutu |
|---|---|---|
| R.O | 63.3 | 68.0 |
| R.1 | 6.9 | 4.7 |
| R.2 | 5.6 | 5.9 |
| R′ | 2.2 | 1.8 |
| r | 21.7 | 19.3 |

On the basis of the above data it is difficult to determine the various racial affinities of these tribal groups since sickle cell trait gene frequency distribution does not agree with ABO gene frequency distribution, which in turn does not agree with Rh gene distribution.

Lehmann has recently found a high incidence of sickle cell trait among the Veddoids of southern India. This has led to a change of point of view in regard to his previous reliance on sickle cell trait as a diagnostic feature in African physical anthropology. He now believes that the Rhesus gene $Rh_0$ (cDe) is more useful in solving problems of African racial affinities. He remarks the following,

> Unlike high $Rh_0$ frequency the sickle-cell trait is only patchily distributed in Africa. The highest incidences have been reported from East Africa where they varied from 30 to 45% in some Bantu tribes. Other Bantu tribes in East Africa have lower incidences of the trait and in Uganda this seems to go parallel with the degree of dilution by recent Hamitic-speaking invaders. If one considers the highest incidences only, one finds that they fall towards the west; at the coast they are 20 to 25%. They also decline the further one goes south and are about 10% in Northern Rhodesia, to become practically nil in South Africa. The Bushmen have no sickle-cells at all, although their $Rh_0$ frequency is high. Similarly, the 'yellow' Pygmies of Central Africa are virtually free of sickle-cells. Thus the trait is not a universal African feature and one may suggest that it entered the Continent with Veddian blood well after the African races had established themselves. (Lehmann, 1953)

There is much to quarrel with in this last statement. First, it has not been proven that the Bantu tribes of East Africa have been very much influenced by the Hamitomorphic Bahima and Batutsi. Second, the Pygmies of Central Africa are not yellow and some of them do have sickle cells. Third, a trait does not have to be universal to be diagnostic. In fact, no diagnostic trait is universal in any racial group or in any geographical area. Fourth, the fact that sickle cell trait is found among the Veddoids of southern India and southern Arabia does not necessarily indicate which way it diffused or that it diffused at all. Why could it not have arisen in both places as mutations? And finally, is it anthropologically enlightening to lump together groups as distinct as Bushmen, Pygmies and Nilotomorphs simply because they agree in a single character? The Bushmen have a high percentage of mongoloid eyefold but no scientific morphologist would claim on the basis of this single character that they are related to the Mongoloids of eastern Asia.

Allison (1954) has pointed out that there is selective advantage in being heterozygous for S-haemoglobin in malarious areas. The researches of Hiernaux and others indicate quite clearly that this cannot be so. The Batutsi, the Bahutu, and the Batwa all inhabit the same malarious area and yet have very different sickle trait gene frequencies.

Neel (1958) and Livingstone (1957) advanced the view that haemoglobin C and haemoglobin S (Sickle cell) are not found among certain "paleo-negroids" of West Africa. The term "paleo-negroid" is very inaccurate since it implies that the typologically negroid groups in question are automatically the descendants of the primordial African Negro. There is no evidence for this whatsoever. If a group typologically embodies a cluster of morphological Negro variations which are at one end of the range of variation, it does not necessarily follow that this group is the descendant of the ancestors of the total Negro racial stock. By the same logic we might advance the view that the primordial Negro ancestor was typologically intermediate between Caucasoids and Negroids, or Mongoloids and Negroids. In my case the absence of S among these particular "Paleo-negroids" proves nothing concerning its antiquity or recentness in negro populations.

Pales and Linhard (1952) in their investigations of sicklaemia in French West Africa have found that the Hamitomorphic Peuls have a higher rate of sicklaemia (11%) than a group of neighbouring Sudanomorphic tribes who have percentages ranging from 6 to 8%. On the basis of the Uganda data one would have expected the opposite.

Although morphological traits may be apparently more modifiable by environmental influence, they do not lose their distinctiveness and diagnostic value for the groups which they distinguish. Although they are not mutually exclusive in their distribution among the various races, they do not exhibit the high degree of inconsistency that the various blood group systems indicate. Mahalanobis, Majumdar and Rao (1949), East and Oschinsky (1958), and Pollitzer (1958) have shown that the use of $D^2$ analysis provides a satisfactory estimate of racial affinities. In the study by East and Oschinsky, the resulting estimates of the 'distance' separating the various racial groups was not at all consistent with the serological data. Pollitzer, on the other hand, states that he found "satisfactory agreement of the two methods" (Pollitzer, 1958). Pollitzer is of the opinion that the agreement is due to hybridization, but states that there is no reliable estimate of "chromosomal relationship between morphological and other genes", which can be made on the basis of his data. He further states that racial analysis should include "a large battery of morphological and genetical traits." As we have already seen, a very large battery of traits can create as much confusion as a single trait.

Physical anthropologists have yet to develop valid scientific criteria which are biologically relevant to studies of the racial affinities of populations. Until these valid criteria are found, morphological analysis and such statistical tools as Mahalanobis' $D^2$ and Penrose's Size and Shape analysis will have to serve as temporary transitional techniques.

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