Communications

Blood Groups in Racial Classification

N. Lahovary [*Science* **117**, 259 (1953)] has attempted a reply to certain criticisms of mine and has presented again his methods of interpreting the blood-group data for various human populations. A. E. Mourant deals with some of Lahovary's arguments in a communication published herewith. I wish to discuss the point of the independence of genes, which Lahovary particularly raises in connection with my criticism.

I stated that Lahovary failed to realize that the characters by which we define races are independent of one another. He says that this is sound common knowledge, and that if he had been guilty of such an offense, he would heap ashes on his head "and wail in the Desert of Ignorance." However, it still seems to me that he did commit this error, and what is more, commits it once again in the very article he has written in his defense. In this article, he says

> Among Negroes of pure blood . . . *all* the features will be characteristic of the black race, notwithstanding the independence of the genes responsible for each character. A specific physical pattern will entail, therefore, just as specific a blood pattern, notwithstanding the theoretical independence of the genes, not only for each blood system, but for each blood group of each system. There is a general specificity working for the unity of each organism and of each racial entity . . . we cannot deny the existence of *parallel trends* making for harmony.

It seems to me that Lahovary, while playing lip service to the independence of the genes, is here trying to maintain that everything about a member of one race is different from the corresponding feature of a different race. This represents a point of view once defended by certain physical anthropologists but now abandoned. According to this obsolete view, it should be possible to identify a skeleton as that of a Negro merely by the examination of any one of the bones. Lahovary, if I understand him, thinks this ought to be possible merely by the determination of the place in any one of the nine blood-group systems into which the individual falls. It does not require much knowledge of serology or genetics to realize that this is sheer mysticism.

It is true that the characteristics of any individual must form a more or less harmonious whole, else he could not have survived fetal life, childhood, and manhood (or womanhood), but this does not mean that the various blood-group characteristics may not be found in individuals of practically any race. It would seem that the various blood-group genes are sufficiently compatible with the other genes that control racial differences (and with one another) to be able to form practically all possible combinations with them. What is characteristic of a race is a certain "constellation of characters" [W. C. Boyd, *Genetics and the Races of Man* (Little, Brown, Boston, 1950)] which has probably been produced by the action of agencies such as mutation, selection, and genetic drift. But there is no ABO or Rh gene, for example, that is found solely in the Negroes. The Rh^0 (cDe) gene, which, by its very high frequencies, serves to characterize Negro *populations,* is found also in many other races, although at much lower frequencies.

Lahovary postulated that the A and B in different populations would prove to be of "different intensity," and in his article in *Science* makes it clear that he was thinking of the subgroups, such as the division of A into A_1 and A_2. It is true that in some cases this does distinguish populations which would seem (judged solely by their ABO frequencies) to be similar, but this is not always true. The Australian aborigines and the Eskimos have remarkably similar ABO groups, having no B and about the same amount of A, and this A is in both cases A_1 exclusively. Some American Indians of North America also have similar frequencies. The amount of group B is similar in various Africans and Asiatics. Subgroups of B have not been convincingly demonstrated in the majority of populations studied. Therefore, it is still merely a hypothesis that the B in populations having similar B frequencies is "of different intensity."

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Received July 3, 1953.

N. Lahovary [*Science* **117**, 259 (1953)] has recently set out the methods and summarized the results of his application of blood-group investigations to the problem of human classification. He has at the same time replied to a criticism by W. C. Boyd and has stressed certain points in which his methods differ from those of Boyd and other workers. In view of the growing importance of this field of research, it is desirable that where different workers use fundamentally different methods, the implications of these should be generally known.

Lahovary has done almost as much as any other worker to apply the published data of blood grouping to the solution of anthropological problems; and most blood-group workers would agree with many of his conclusions. He, however, applies directly to anthropology the crude phenotypic classifications of the serologist and only very rarely and incidentally makes use of the accepted methods of genetical research. He thus places blood-group phenotypes in almost the same category as skin-color or head-form phenotypes. To most workers in the field, on the other hand, the very great and almost unique value of the blood groups in anthropology lies in the fact that their inheritance has been completely worked out in terms of Mendelian genetics, and that the established methods of genetical research are thus directly applicable to the solution of anthropological problems.

As one justification of his use of phenotype frequencies, Lahovary speaks of "the AB group conforming to expectation in the whites and, to a more limited extent, in the blacks, whereas it is much higher than the expected values in the Mongoloids and in the populations with a Mongoloid or Eurasiatic admixture." He states that "in the white fringe, a higher frequency of AB than the expected value is a diagnostic indication of Asiatic admixture" and (without giving any reference) that "Myslaveč assumes that this racial trait is probably due to a slightly different position of the respective genes in the yellow races, favoring certain linkages." I have found no evidence of this supposed excess of AB; moreover, of the five sets of observations on "Eurasiatics and Mongoloids" quoted in Table 1 of Lahovary's paper, four show a deficiency of AB, the fourth set being 100 percent group O. If, however, any bodies of data should show such a significant and consistent excess, the first thought of any serologist would be a suspicion of technical errors. If such errors could be eliminated from consideration, various genetical possibilities would have to be considered and explored, and until the purely genetical problem had been solved it would be necessary to refrain from drawing any anthropological conclusions from the material.

A corollary of Lahovary's attitude to phenotypes in isolation from the underlying genetical situation is his use of the "index of deviation" and the incorporation of such indices in a special type of deviation diagram. The index of deviation, though apparently a simple mathematical quantity, has no clear statistical meaning, and it incorporates and confuses the true differences between populations together with the sampling errors for each of them (as well as technical errors in the testing of them).

It is desirable, for certain purposes, to have a quantitative expression of the difference between two populations. As far as the ABO groups are concerned, this is very simply given in both direction and magnitude by the line on a Streng triangular diagram, which joins the two points representing the populations concerned. A single Streng diagram can thus incorporate with a high degree of statistical efficiency the information that is much less efficiently expressed by a number of Lahovary diagrams one less in number than the total number of points on the Streng diagram.

Where the number of independent variables concerned is greater than two, the mathematical expression of differences between populations poses a highly complex problem that is not solved by Lahovary's device of summing indiscriminately the differences in percentage frequencies of all phenotypes.

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Received July 15, 1953.

Rejoinders to W. C. Boyd and A. E. Mourant

In answer to my reply in *Science* to certain criticisms of my work by W. C. Boyd, who alleges that I do not give due recognition to the independence of the genes, Boyd maintains that I still commit this error. However, our points of view are not as far apart as Boyd seems to believe. The difference is not fundamental but lies more in stressing what *distinguishes* the various races or what they share *in common.*

The reader may judge for himself. I wrote: "There is a general specificity working for the unity of each organism and of each racial entity . . . we cannot deny [that is, notwithstanding the theoretical independence of the genes] the existence of *parallel trends* making for harmony." What does Boyd answer? "It is true that the characteristics of any individual must form a more or less harmonious whole. . . . What is characteristic of a race is a 'certain constellation of characters'." It does not appear to me that the difference between "parallel trends making for harmony" and a "constellation of characters forming a more or less harmonious whole" is very easy to perceive.

It might even be contended that, on the whole, "parallel trends" leave more to the independence of the genes than a "constellation of characters," a constellation implying, in the cosmos, a permanent and, judged by human measures, an irrevocable relationship. In slightly different terms, we therefore express a nearly similar opinion. Boyd's assertion that I am "paying lip service to the independence of the genes" is consequently somewhat gratuitous. What is unfortunately still more gratuitous is his saddling me with the strange theory that each individual has only his own racial genes, that, for instance, I presume that the ABO or Rh genes of the Negro or *everything* about a member of one race is different from the corresponding feature in a member of another race. This accusation is all the more surprising since my definition of "parallel trends," previously mentioned by Boyd, excludes such an interpretation. Moreover, this would also imply that I deny the existence of a human species, for it is clear that if every race had *only* its specific genes, there would be not *one* human species subdivided into various races but *several* different species of "humans." Needless to say, I never have harbored, nor could be supposed to harbor, so wildly revolutionary an idea.

The real difference between Boyd's conceptions and mine lies in the difference in emphasis. Whereas he stresses the *similarities* among the races and thus, indirectly, the independence of the genes, I stress their *distinctiveness* and, thereby, the racial correlations of the genes, because, as stated by F. v. Eickstedt, the great German anthropologist: "All characters are not inherited independently; on the contrary, most of them [I would say personally, at any rate many of them] are transmitted in correlated groups. . . . There could be otherwise no racial types, nor even any definite types at all." [*Rassenkunde und Rassengeschichte*