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AFRICAN ANCESTRY OF THE WHITE AMERICAN POPULATION*

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Defining a racial group generally poses a problem to social scientists. A definition of a race has yet to be proposed that is satisfactory for all purposes. This is particularly true when the racial group has minority group status as does the Negro group in the United States. To many persons, however, the matter of race definition is no problem. They view humanity as being divided into completely separate racial compartments. A Negro is commonly defined as a person having *any known trace* of Negro ancestry or "blood" regardless of how far back one must go to find it. A concomitant belief is that all whites are free of the presumed taint of Negro ancestry or "blood."

The purpose of this research was to determine the validity of this belief in the non-Negro ancestry of persons classified as white. Current definitions of Negro may have serious limitations when used as bases for classifying persons according to ancestry (Berry, 1951). The terms *African* and *non-African* will be used rather than *Negro* and *white* when discussing the ancestry of an individual. Each of the former pair of terms has a more specific referent which is the geographic point of origin of an individual. At the same time, the two pairs of terms are closely related. Hence, this paper is the report of an attempt to estimate the percentage of persons classified as white that have African ancestry or genes received from an African ancestor.

This raises a question concerning the relationship between having an African ancestor and receiving one or more genes from this ancestor. Since one-half of an individual's genetic inheritance is received from each parent, the probability of a person with one African ancestor within the previous eight generations receiving *any single gene* from this ancestor is equal to or greater than $(0.5)^8$ or 3.9063×10^{-3} . It has been estimated that there are approximately 48,000 gene loci on 24 chromosome pairs (Stern, 1950). The probability that an individual with one African ancestor has *one or more* genes derived from this ancestor is equal to $1 - (1 - 3.9063 \times 10^{-3})^{48,000}$ or greater than 0.9998. Having more than one African ancestor increases this probability. One final remark needs to be made. Some degree of African ancestry is not necessarily related to the physical appearance of the individual. Many of the genes possessed by virtue of descent from an African do not distinguish the bearer from persons of non-African ancestry. They are the genes or potentials for traits which characterize the human race. Nevertheless, these genes represent an element in the biological constitution of the individual inherited from an African.

RESEARCH METHODOLOGY

The research methodology of this study involved constructing a *genetic probability table*. The primary function of this type of table is to ascertain the distribution within a known population of a variable that can not be observed directly. It is frequently used to estimate the changes that occur in the genetic composition of a population over a period of time. There are three basic steps in the computation of a genetic probability table.

1. A series of assumptions which serve as a basis for the table is made. These assumptions may refer to the initial distribution of the variable within the popu-

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lation, the effect of biological and non-biological factors on the distribution, or the interrelationships of these factors. In some cases, these assumptions may be derived from available empirical data.

2. On the basis of these assumptions, the probability distributions of the variable within the population for successive time intervals are computed. This is done by applying the rules of probability relevant to the principles of biological inheritance to the changes that are known to have occurred in the observable characteristics of the population.

3. The validity of the probability table is determined by comparing the probability values included in the table to probability values obtained from empirical studies based on other research methods. The extent to which these values correspond is a measure of the validity of the table.

Sources of data.—The best data available for use in estimating the biological background of Americans are those dealing with the population of this country. Official records have been kept of the white and Negro population since 1790 by the Bureau of the Census and of the influx of foreign population to this country since 1820 by the Immigration and Naturalization Service. Numerous estimates of population and immigration figures have been made for the period 1660 to 1820. There is general agreement among historians, statisticians, and population analysts on the relative reliability of the data for the years since 1750 only (Carey, 1853; Bromwell, 1856; Bancroft, 1891; Greene, 1932; U. S. National Resources Committee, 1938). Estimates have been made of the volume of illegal smuggling of slaves into this country between 1808 and 1860 (U. S. Bureau of the Census, 1909; Dublin, 1928). Thus, it was possible to obtain usable data for each decennial period since 1750.

Assumptions and estimating equations.—In this study, all persons were classified into four racial-ancestral categories: white persons with no African ancestry (wna), white persons with some degree of African ancestry (wa), Negroes with some degree of non-African ancestry (nna), and Negroes with African ancestry only (na). The following assumptions were used as bases for statistically estimating the probability of African and non-African ancestry.

1. The white population of the American colonies in 1750 contained no persons of African ancestry. Any African element introduced into the background of supposedly white persons prior to 1750 was regarded as unimportant since the probability of possessing genes from any given ancestor decreases rapidly after ten generations from the introduction of these genes.

2. All individuals classified as Negro have some degree of African ancestry.

3. The probability of a male member of any of the four racial-ancestral categories being a partner in a fecund mating during a given period of time is equal to the proportion of the total population in the category at the beginning of the time period. In other words, if one-tenth of the total population are white persons of non-African ancestry, one-tenth of all fecund sexual contacts involve white males of non-African ancestry. The same is assumed for females.

4. The probability of persons classified as white mating with persons classified as Negro is one-twentieth of what would be expected if mating were random. To illustrate, if 90 percent of the population were white and 10 percent were Negro and *mating were random*, 18 percent of all fecund matings would involve a white and a Negro. According to this assumption of *selective mating*, the percentage of fecund matings involving members of different racial categories would be nine-tenths of one percent in this case. It should also be remembered that virtually all of the offspring of these mixed matings would be classified as Negro.

5. The proportion of the increase in population due to causes other than immigration from Africa and Europe during a given period that can be assigned to a racial-ancestral category is equal to the probability of a live birth being a

member of that category. These causes include natural increase, emigration, and immigration from racially mixed areas (West Indies, Mexico, Central and South America). If one-third of the live births during a given period are white persons of non-African ancestry, one-third of the increase due to these causes is comprised of white persons of non-African ancestry.

6. All persons immigrating to the United States from Europe are of non-African ancestry only. Due to the small number of African Negroes in Europe, the incidence of African ancestry among Europeans is relatively small.

7. All persons immigrating to the United States from areas in Africa are of African ancestry and one-tenth of them have some degree of non-African ancestry.

Several equations were used in computing the probability of an individual drawn at random from the population being a member of each of the four racial-ancestral categories. The first was used to estimate the number of white persons with only non-African ancestry. The crucial problem was estimating the portion of the population increase due to causes other than immigration from Europe and Africa during a censal period that had no African ancestry. The symbol $P(wna)$ was used to represent the proportion of the population that was both white and of non-African ancestry only in a given censal year. Under the third and fifth assumptions, the proportion of the population increase mentioned above during the subsequent period assigned to this racial-ancestral category equalled $P(wna)^2$. The assumption of selective mating (assumption 4) required an additional increment. $P(w)$ and $P(n)$ represented the proportions of the population that were classified as white and Negro, respectively. The proportion of the increase falling in the mixed parentage category during the following ten-year period was calculated to be $P(w)P(n)$. Although 95 percent of this group was assigned to the white category under the .05 selective mating factor of the fourth assumption, only a proportion equal to

$$.95 \frac{P(wna)^2}{P(w)^2}$$

was assigned to the category of white with no African ancestry. This limitation was imposed by assumption 3. Hence, the proportion of the increase classified as white with no African ancestry equalled

$$P(wna)^2 + .95 \frac{P(wna)^2 P(n)}{P(w)}$$

The absolute number in this category was obtained by multiplying by the magnitude of this population increase.

According to the sixth assumption, immigration from Europe during a censal period included no persons of African ancestry. The number of whites with no African ancestry at the end of a censal period was obtained by adding these two figures to the number in this category at the beginning of the period. The final form of the equation was

$$N(wna) = Y + P(wna)^2 Z + .95 \frac{P(wna)^2 P(n)}{P(w)} Z + I_E$$

- where
- Y = estimated number of whites having no African ancestry in the preceding censal year
 - $P(wna)$ = probability of a person being classified as white with no African ancestry in the preceding censal year
 - $P(n)$ = probability of a person being classified as Negro in the preceding censal year
 - $P(w)$ = probability of a person being classified as white in the preceding censal year
 - Z = increase due to causes other than immigration from Europe and Africa during preceding decade
 - I_E = immigration from Europe during preceding decade

The estimated number of whites having some degree of African ancestry was obtained by subtracting the estimated number of whites having no African ancestry from the total number of persons classified as white.

A similar procedure was followed for the Negro ancestral categories. To estimate the number of individuals that are Negro and have only African ancestry for a given censal year, another equation was used.

$$N(\text{na}) = X + P(\text{na})^2 Z + .95 \frac{P(\text{na})^2 P(\text{w})}{P(\text{n})} Z + .90 I_A$$

where

- X = estimated number of Negroes having only African ancestry in the preceding censal year
- P(na) = probability of a person being classified as Negro with African ancestry only in the preceding censal year
- P(n) = probability of a person being classified as Negro in the preceding censal year
- P(w) = probability of a person being classified as white in the preceding censal year
- Z = increase due to causes other than immigration from Europe and Africa during preceding decade
- I_A = immigration from Africa during preceding decade.

The estimated number of Negroes having some degree of non-African ancestry was obtained by subtracting the number of Negroes with only African ancestry from the total number of Negroes in the population. The probability values for a given censal year needed to complete the genetic probability table were obtained by dividing these four sets of numerical estimates by the total white and Negro population at that time.

Criteria of validity.—Three types of empirical studies were used in determining the validity of the genetic probability table based upon the above assumptions. These included studies of the mixed ancestry of Negro groups, the frequency of children born of mixed parentage, and the frequency of passing.

RESEARCH RESULTS

A genetic probability table was constructed on the basis of the above data and assumptions. This table included the probabilities of an individual drawn at random from the population of the United States being a member of the four racial-ancestral categories. These probabilities were computed for every tenth year from 1750 through 1780 and each censal year since 1790. In order to highlight the relative size of the two groups with mixed ancestry, the probability values in this table were converted to absolute numbers. Table 1 includes these data for successive censal years. The percentages of the two racial categories that have both African and non-African ancestry are also included.

The data in table 1 indicate that approximately 21 percent of the persons classified as white in 1950 have an African element in their inherited biological background. The percentage of persons classified as white having some degree of African ancestry was extremely small in 1790. The percentage figures for successive censal years increased most rapidly between 1790 and 1850. Although this is partly a function of the computational methods used, it is characteristic of interbreeding populations. The figures for the period 1850 to 1890 were comparatively stable. Between 1900 and 1930, the percentage declined slightly. These two shifts were primarily the result of large-scale immigration from Europe. With the curtailing of this immigration, the percentage values began increasing again in 1930.

One final question pertains to the validity of these data. As mentioned above, three criteria were used to ascertain the validity of the probability values used in deriving table 1. Two of the criteria involved the incidence of mixed

ancestry among persons classified as Negro. First, the percentage of Negroes that had some degree of non-African ancestry was computed for each censal year. Table 1 shows that from 64.8 to 73.0 percent of Negroes had some degree of non-African ancestry in the last four censal years. These figures correspond closely to those included in studies of Negro groups made by Hrdlicka (1928),

TABLE 1

Total white and Negro population, white population with African ancestry and Negro population with non-African ancestry, United States, 1790-1950

Year	White population			Negro population		
	Total (000's)	African ancestry		Total (000's)	Non-African ancestry	
		Number (000's)	%		Number (000's)	%
1790	3,172	62	2.0	757	144	19.0
1800	4,306	164	3.8	1,002	209	20.9
1810	5,862	303	5.2	1,378	450	32.7
1820	7,887	623	7.9	1,772	620	35.0
1830	10,537	1,134	10.8	2,329	842	36.2
1840	14,196	1,939	13.7	2,874	1,041	36.2
1850	19,553	2,975	15.2	3,639	1,389	38.2
1860	26,923	4,508	16.7	4,442	1,738	39.1
1870	33,589	6,035	18.0	4,880	1,935	39.7
1880	43,403	7,961	18.3	6,581	3,248	49.4
1890	55,101	10,383	18.8	7,489	3,902	52.1
1900	66,809	13,020	19.5	8,834	5,002	56.6
1910	81,364	14,150	17.4	9,828	6,050	61.6
1920	94,120	16,703	17.7	10,463	6,780	64.8
1930	108,864	20,120	18.5	11,891	8,086	68.0
1940	118,215	23,035	19.5	12,866	8,993	69.9
1950	134,942	28,366	21.0	15,042	10,980	73.0

TABLE 2

*Estimated extent and rate of passing,
United States, 1861-1950*

Period	Estimated number of persons passing	Annual mean	Annual rate*
1861-1890	90,900	3,030	0.68
1891-1910	101,300	5,065	0.68
1911-1930	183,200	9,160	0.93
1931-1940	42,700	4,270	0.36
1941-1950	155,500	15,550	1.21

*Rate per 1,000 Negro population per year.

Herskovits (1930), and Hooton (1939). Second, estimates of the percentage of Negroes born of mixed parentage were made on the basis of the probability values included in the gentic probability table. The percentage born of mixed parentage varied between 7.9 percent in 1850 and 8.4 percent in 1920. These computed values do not conflict with any of the data cited by Herskovits (1928), Day (1932), and Frazier (1939). Furthermore, these values are almost

the exact values needed to account for the rates of gene transfer computed by Glass and Li (1953).

The third criterion centered around the phenomena of passing. The increase in the number of persons classified as white having some degree of African ancestry given in table 1 could have occurred only if there were a continuing influx of persons into the white group from the Negro group. The magnitude and rate of passing needed to account for the indicated increase were computed for the period 1860 to 1950. These data are given in table 2. They fall well within the range of frequency of passing as empirically estimated by Hart (1921) Burma (1946), and Eckard (1947). The data in table 2 also indicate that the rate of passing is increasing.

CONCLUSIONS

The data presented in this study indicate that the popular belief in the non-African background of white persons is invalid. Over twenty-eight million white persons are descendants of persons of African origin. Furthermore, the majority of the persons with African ancestry are classified as white. Finally, if the volume of immigration remains at the present relatively low level, the percentage of persons having mixed ancestry will increase in the future. One conclusion stands out from these data. The belief in the racial uniformity of an individual's ancestors may be the basic myth of the white man's past.

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