News of Science

Blood Groups in Physical Anthropology

In 1950 W. C. Boyd prophesied, in his book *Genetics and the Races of Man,* that physical anthropology, in its effort to get closer to the genes that distinguish the varieties of mankind, would tend to forsake the study of bones and skull shapes, skin color and hair form, and would focus more and more sharply on the blood groups as the best of known genetic characters to use in order to detect the heritable differences between populations and the shifts in gene frequencies that result from migration and from hybridization, genetic drift, and selection. Although there was some outcry from more conventional anthropologists at such an extreme point of view, there has in truth been in the past 6 years a veritable flood of anthropological publications dealing with the blood groups. To be convinced of this, one needs only to take a look at Mourant's comprehensive volume on *The Distribution of the Human Blood Groups* (1954) and to note the 1716 papers in this field that are listed in the bibliography as having been published since Boyd's monograph of 1939.

Another, perhaps more interesting way of noting the current activity in the anthropological study of the blood groups is to examine recent journals for contributions on the subject. *Nature,* on 7 Jan. 1956, published three reports in that single issue dealing, respectively, with the blood groups of the Carajás Indians of Brazil, with the occurrence of the new Diego blood factor in Venezuela, and with the presence of the same factor in Brazilian Indians. It is a distinct relief to learn that the high frequency of blood group gene *B,* once reported to exist in the Carajás Indians, and so inexplicable in American Indians, who characteristically lack *B* entirely, has now been shown by P. C. Junqueira and P. J. Wishart to be a false deduction from slide tests that yield dubious results. More accurate modern methods show no *B* at all in these Indians, although there is about a 50-percent frequency of Duffy positives among them.

The new Diego factor, which was discovered in 1953 in Caracas, is now found to be extremely rare in U.S. whites. Its frequency in the urban populations of Venezuela is low (2 to 4 percent), and it is not common in Venezuelan Negroes (7.3 percent) or Arawaco Indians (5.3 percent); however, it is extraordinarily common in the Carib Indians (35.5 percent) and in the Kaingángues and Carajás Indians of Brazil (46 percent and 36 percent, respectively). The two latter tribes, although they belong to the same linguistic family, live about 1000 miles apart. The two teams of workers reporting these studies consisted, respectively, of Philip Levine and his U.S. and Venezuelan collaborators, and of P. C. Junqueira, four Brazilian colleagues, and Hans Kalmus of the Galton Laboratory, London.

Recent issues of the *American Journal of Physical Anthropology* have carried a number of papers on the distributions of blood group genes. In the June 1955 issue Bruce Chown and Marion Lewis extended their studies of the frequencies of blood group and secretor genes in the Blackfoot Indians of Alberta to include the Stoney and Sarcee Indians. The separation of pure-blood and mixed groups offers valuable evidence of the trends and amounts of intermixture.

In the same issue M. Lewis, B. Chown, and R. F. Peterson reported on the distribution of the Kell-Cellano group among the white individuals of Manitoba; and C. S. Lacaz *et al.* gave the incidence of the Kell factor in the population of São Paulo, Brazil. In spite of ethnic differences, the *k* allele has an almost identical frequency in these two populations: 0.9643 in Manitoba; 0.959 in São Paulo. Chown and Lewis have also reported on the frequencies of the blood group and secretor genes in the Blood Indians of Alberta (*Am. J. Phys. Anthrop.,* Sept. 1955), and in doing so have turned up the fifth Indian tribe in which the rare Rh allele *cdE* is present.

In the same issue Jean Hiernaux has dealt with the puzzling variations in frequency of the sickling hemoglobin gene in the Belgian Congo and other regions of Africa. Rejecting the hypothesis of an extremely high mutation rate to keep the detrimental gene at a high level in certain populations, he argues that there must be an equilibrium between a favorable action of the gene when it is heterozygous and an unfavorable one when it is homozygous, although possibly genetic drift has also played a part in locally preserving it and increasing its frequency. The center of origin of the gene cannot be determined at present, because of the instability in the frequency of the gene and the great amount of intermixture between populations high in its frequency and others low in its frequency. Hiernaux is reserved toward the Veddoid theory of origin of the sickle-cell gene recently proposed by Lehmann, and he rightly points out that the introduction might as well have gone in the other direction. The absence in the Veddoids of India of the R^o allele, so very characteristic of all Negro peoples, denies a close relationship between Negroes and Veddoids, whichever way the gene for sickling went.

R. T. Simmons, J. J. Graydon, and other coworkers have for some years been engaged in a vast survey of blood-group frequencies in the Australasian and South Pacific areas. To date they have covered various Polynesian groups, such as the Maori; Melanesians, such as the Gilbertese, Fijians, Admiralty Islanders, New Hebrideans, and New Caledonians; Micronesians, such as the Palauans, Trukese, and Kapingas; Indonesians; Australian aborigines; Siamese; and even the Chenchu from southern India and the Ainu from Hokkaido, Japan. The latest in their series of papers (*Am. J. Phys. Anthrop.,* Dec. 1955) is an addition to the Polynesian studies—the Cook Islanders. The frequencies found in the latter confirm the distinctness of Polynesians from other Pacific islanders, and also indicate that the Cook Islanders differ from the Maoris by having some Melanesian admixture. The Polynesians show a basic blood-group relationship to the American Indians and Mongoloids rather than to Melanesians, Micronesians, or Indonesians.

Another interesting study reported in the December issue of the *American Journal of Physical Anthropology* deals with the blood groups of the Hottentots. A. Zoutendyk, A. C. Kopec, and A. E. Mourant, who previously have reported on the blood groups of the Bushmen, have collected data which show that the Hottentots are very similar to the Bushmen but different in some respects. R^o has a frequency of 68 percent in Hottentots, a value high but not so high as in the Bushmen (80 percent). *B* (19 percent) is higher than in Bushmen or any South African Bantu populations. The frequency of the Henshaw gene in Hottentots is the highest known (5 percent). The Lutheran gene, which in other Negro peoples approaches the European frequency (4 percent), is absent in Hottentots and Bushmen. Thus, while both

Hottentots and Bushmen show an "essentially African picture," the deviations are not the same in the two groups.

In two communications in the December 1955 issue of the *American Journal of Human Genetics,* D. F. Roberts and I have independently reestimated the amount of white admixture in the present composition of the U.S. Negroes by using the newer blood-group data from Nigeria and other parts of West Africa supplied chiefly by Mourant and his coworkers. Roberts arrives at an estimate of 20-percent white admixture in the Negro gene pool, with a gene flow from the white into the Negro gene pool of 0.02 to 0.025 per generation during the past 250 to 300 years. I have obtained a slightly higher estimate (about 22 percent) or, if the anomalous D^u frequencies in the West Africans are considered as derived from *D,* an amount of 28 or 29 percent. I have also used recent data on blood-group frequencies in presumably pure American Indians to see whether Indian admixture exists in the present U.S. Negro gene pool. The evidence is reasonably clear that there is no statistically significant component of that origin within the groups sampled.

The number and geographic distribution of such anthropological studies as these—this brief survey makes no pretence to completeness—strikingly demonstrates the activity of the field and the strong new trend in physical anthropology.

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U.N. Committee on Radiation Effects

The United Nations Scientific Committee on the effects of Atomic Radiation has ended its first series of meetings. For approximately 10 days the committee discussed in detail the scientific problems involved in carrying out the mandate of the General Assembly that it examine the "effects of radiation on man and his environment." Working groups considered seven topics: genetics, the effects of irradiation by internally absorbed isotopes, the effects of external radiation, natural radiation background, exposures during medical procedures, occupational exposure, and environmental contamination.

It was pointed out that, in the field of genetic effects, for example, sufficient information on which to base definite conclusions is not available. Before making recommendations, the committee has asked the Secretariat to collect by 1 Aug. from U.N. member states and from specialized agencies preliminary measurements of natural radiation background and of environmental contamination caused by man-made radioactivity. Specific information on local geographic, geophysical, and demographic conditions will be studied to see if any correlation in biological changes can be obtained from areas with different levels of natural radiation background. Methods of estimating the biological effects of small doses of radiation are also considered essential, and the committee has requested August reports on these, too. The committee's next meeting will take place in October.

Other information that the committee plans to collect on the effects of irradiation will come from various sources. Among these are patients who have been treated with radiation or who have undergone repeated radiological examinations and workers who have been exposed to these hazards in their occupations. For all people whose work exposes them to ionizing radiations, the committee has recommended the maintenance of continuing personal files that would include information from periodic medical examinations. The committee has also decided to establish a means of speedy collection and examination of information on any accidental overexposure.

In addition to requesting measurements over the surface of the earth of radioactive fallout, the committee has also asked for information on the amount, distribution, and composition of radioactivity that still remains in the upper atmosphere. Part of this activity falls on the earth each year and is thus a continuing source of possible increases in radiation levels. However, data available to the committee at this time from India, Sweden, the United Kingdom, and the United States indicate that fallout to date is only a fraction of the natural background.

Although it is calling for information almost immediately in several scientific areas, the committee recognized that standard procedures of measurement have not been formulated and accepted internationally. It has been decided to distribute information on known procedures of measurement as quickly as possible. At the same time, the committee will study and compare these procedures prior to its next meeting with the hope that internationally acceptable standards can be established without delay.

U.S. Technical Education

The following facts about the state of technical education in this country were included in recent testimony before the Research and Development Subcommittee of the Joint Congressional Atomic Energy Committee.

The number of trained engineers in the Soviet Union increased from 41,000 in 1920 to 541,000 in 1954, a 1300-percent rise. In the same period, the United States increase was from 215,000 to 500,000.

The number of engineering graduates from Soviet higher institutes rose from 28,000 in 1950 to 63,000 in 1955. In the same period, the number of United States engineering graduates dropped from 52,000 to 23,000.

The Soviet Union is graduating 120,000 engineers and scientists every year to this country's 70,000. Our new crop of graduate engineers is already only half of the 45,000 to 50,000 we need each year within our own national boundaries.

The number of qualified teachers of science and mathematics in United States high schools has dropped 53 percent in the last 5 years, while high-school enrollment has increased by 16 percent. And even this gives a misleading impression, because not more than half of the qualified teachers in these fields actually go into teaching.

Fifty-three percent of all high schools in the United States do not teach physics and only half of the high schools teach chemistry. In addition, a recent survey indicates that between 250,000 and 400,000 United States high-school students are taking their mathematics and scientific training from teachers who are not qualified to teach these subjects.

News Briefs

■ The Bureau of Economic Research and Statistics of the American Dental Association estimates that there are 97,529 dentists in the United States, one for each 1667 persons. The figures are based on the 1956 *American Dental Directory,* which was issued recently by the association.

The survey of the dental profession indicates that there are 1646 more dentists than last year, when it was estimated that there was one dentist for each 1669 persons, and 3803 more than in 1954, when the ratio was one dentist for each 1677 persons.

■ Another coelacanth [**122**, 868 (4 Nov. 1955)] was caught on 4 May off the Comoro Islands, between Madagascar and the African mainland. It is 6 feet, 6 inches long and is believed to be a female. A military plane was dispatched from Tananarive, Madagascar, to bring the fish back to local laboratories before it could decompose. Only one other female coelacanth has been caught before.

■ Portugal hopes to establish by the end of 1957 a laboratory for nuclear physics that will include an experimental reactor and other research equipment.