

CHANGES IN HUMAN BIOLOGY

BY

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AT this stage of human history vast changes are affecting the distribution, population density, and ways of life of human communities all over the world. Enormous advances in technology make it certain that many communities, which have been changing slowly or not at all, will relatively soon be totally transformed.

We are, therefore, in a period when the biology of the human race is undergoing continuous change measured in terms of health, fitness and genetic constitution.

An inventory, in biological terms, of human populations the world over which was really comprehensive would tell us much about the limits of human adaptability. It would have far-reaching consequences on our views on some critical biological problems, for example on population expansion and on the race problem.

Apart from their bearing on questions of "race", the worldwide collection of biological data will give us an insight into many aspects of human adaptation as well as provide human standards of biological well-being.

Views on Climatic Effects

If co-ordinated worldwide surveys on physique and growth are carried out, using standardized anthropometry, as well as intensive studies of heat and cold tolerance (as planned in the International Biological Programme), we shall have a much better basis for the supposition that climate has played a part in shaping human physique.

If populations of similar genetic constitutions, living in contrasting habitats can be compared, it should be possible to establish that in some cases at least modification of physique by climate is not dependent on specialised genotypes

but is acquired during the developmental period.

We have little population data on the range and variability of physical fitness. Our remote ancestors, who depended on strength, endurance, physical stamina and skilled muscular activity for their survival, required a level of fitness only to be estimated now by studying peoples still living in subsistence-hunting economies, and this might well be compared with that of urbanized workers in occupations which require muscular fitness—dockers or miners, for example.

We can fix the range of "fitness" even wider by looking at the most physically efficient of our population—the athletes—at one end of the scale and by examining the "sedentary" groups of our urbanized society at the other.

We are so accustomed to the ecological control secured by the genus *Homo* through purely technological means that it is easy to forget that man still relies on a remarkable flexibility of physiological, metabolic and endocrine response to cope with changes in his environment.

Heat Acclimatization

After about a week, the subject, who previously could not carry out moderately hard work in a temperature of, say, 28 degrees Centigrade in conditions of sunlight and high humidity for more than an hour, will be able to carry on for three or four times as long in the same conditions.

The basis for this adaptation is to be found in increased sensitivity and training of the sweating apparatus, as well as in hormone changes leading to a retention of sodium and salt, so bringing about increases in the circulating blood

The following are extracts from Prof. Weiner's presidential address to the Anthropological Section of this year's meeting of the British Association for the Advancement of Science held at Nottingham.

Prof. Weiner's address, delivered on September 5, was entitled "Aspects of Adaptation".

volume.

The practical value of this improvement cannot be underestimated. The important point is that European workers in hot industry, or Europeans who have lived in, say, Singapore for a hot season or so, Africans in Nigeria, Saharan Arabs, etc.—all these show precisely the same capacity to acclimatize to heat.

Resistance to Cold

In terms of the whole body cooling, there is evidence that Australian aborigines and bushmen show great resistance to cold. These people, like those in Patagonia and the High Andes, are able to sleep in conditions which newly arrived Europeans find extremely uncomfortable.

With time, however, Europeans also—as was demonstrated, for example, in the Antarctic expeditions—can learn to sleep with greatly reduced amounts of insulation at extremely cold temperatures. What remains under dispute is the mechanism underlying the increased resistance.

Genetic study of physiological adaptability, whether it be tolerance to heat, cold, altitude, exercise or pathogen, remains almost totally neglected; it represents one of the most promising fields for the human biologist.

(B.I.S.)