

HUMAN BIOLOGY IN EDUCATION*

UNTIL comparatively recently biology might well be said to have been the 'Cinderella' of the sciences so far as primary and secondary education in Great Britain were concerned. Over a period of about ten years, however, the subject has become recognized more and more as of vast cultural and academic importance. Consequently it is finding its place in many schools where it was hitherto completely ignored and in all cases the number of students studying biology has increased. This is well exemplified in the number which take the subject in the School Certificate, though even to this day the percentage is far too low. During 1940 in the School Certificate 22 per cent took biology and 19 per cent General Science; in the Higher School Certificate only 7 per cent took biology.

We are, however, not concerned so much with the importance of biology as an educative subject but rather with the form and content of the biological syllabuses from junior school to university. The syllabuses are unsatisfactory from several points of view but the most important is that of man himself. In most syllabuses he scarcely finds a place. One reason for this might easily be that many academic biologists do not realize that biology is the science of life and not merely a union of zoology with botany. Human biology is the science of life as it affects man himself and it thus finds itself invoking aid not only from zoology and botany but also from the other specialized biological sciences such as medicine, agriculture, anthropology, ethnology and sociology. Human biology consists of a comparative account of the anatomy and physiology of the human body followed by further inquiries into man's place in the web of life, the nature of diseases, especially as they affect mankind, inheritance, and so forth. These are certainly essential components of human biology but the potentialities and applications of this tremendous subject are legion. Surely the study of the biology of mankind must not merely be regarded as a detached and academic survey of structure and function. It must go further and launch bravely into investigations of all these powerful individual social relations which are biological in origin. The question of the results of both good and bad nutrition is involved. The same can be said for population movements and their attendant effects, not excluding war. Soil and its significance is another aspect. So is the influence of psychological study as a powerful weapon in the hands of thinking and feeling man. Human biology is therefore the biology of mankind, not merely the biology of man.

Knowledge of the general principles of positive health is essential in these modern times of urban living, yet it receives scant attention in most biology courses. Aspects of healthy living such as fresh air, housing, exercise, personal cleanliness, human parasites, risk of infection, industrial diseases, etc., need not necessarily be grouped together under a general heading of health, because pegs on which arguments in this connexion can be based are constantly cropping up in a course of biology so that health subjects could be brought in at various points thus giving,

apart from empirical knowledge, what is just as important, additional interest.

The science of nutrition was beginning to take shape long before the War. People were beginning to become vitamin conscious but very often along the wrong channels. There are very few people now who have not heard of vitamins, if only through the medium of a dance tune. It is doubtful, however, if one per cent of the population could give any idea of what a vitamin is or what it does. This should therefore form a subject of instruction and the biology course is the place for it. The history of work on vitamins, from the empirical work in the sixteenth century of the navigator Hawkins and later of Dr. J. Lind to the biochemistry and physiology of to-day, simply told, would be of great educative value. The same applies to nutrition. The sociological and economic implications of nutrition have been brought out very clearly by such workers as Sir John Orr, and their work is receiving the consideration it deserves in the planning of the national health and diet. But this is due to the exigencies of war; it must continue in peace-time, and the basis for its continuance lies in the schools and the universities. A detailed knowledge of the chemical composition of carbohydrates, proteins, fats and mineral salts and vitamins is not necessary, but some knowledge of the significance of these foodstuffs in relation to energy, body-building, malnutrition, deficiency diseases, etc., is desirable.

Technical knowledge which might be considered for inclusion in biological courses especially in the schools involves such subjects as farming and gardening. Schools in rural areas often include these subjects in their curricula though in most cases they are treated as separate subjects. They might well be incorporated in a general biology course, but in spite of this only about one in every ten of the British farmers receives any form of technical training.

Another important subject to whom biological knowledge would prove of inestimable value is the mother in the home. The home with its family life is a veritable biological laboratory. Yet few mothers are technically prepared for the responsibility of directing that laboratory, having little or no knowledge of such subjects as normal psychology, health, hygiene, nutrition, sex, child development and child guidance. Other examples could be given, but here are two—one of man outdoors and one of man indoors—which show what a mistake is this ignorance of the general public where elementary problems of the biology of mankind are concerned.

Human reproduction, too, should be given its logical position in biology curricula. It should not be avoided or ignored; nor again should it be over-emphasized. One is on safe ground in stating that by far the majority of elementary biological curricula, though probably dealing with sexual reproduction in general, and in plants and a certain number of the lower animals in particular, stop at the stage where human reproduction should be logically considered. This is undesirable, but, on the other hand, there is a risk of over-emphasizing it. Human reproduction could be brought into that part of the curricula dealing with heredity in plants and animals. Here reproduction might be combined with considerations of evolution, variation and genetics. Heredity in

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man is a very wide subject but general points are valuable even to the child mind. The biological conception of ethnic races, for example, should be emphasized, thus, especially at the present time, counteracting the poisonous results of the prostitution of such concepts for political advantage such as is seen in the Nazi Aryan theory of *Herrenvolk*. A general review of these subjects would develop a social consciousness among children and students towards people of weak hereditary endowments.

A general idea of the origin of man could naturally follow instruction on evolution and heredity. So, too, could the origin of many of man's social attributes which would involve an elementary study of the main conceptions of anthropology, ethnology and archæology. This is scarcely touched upon in schools. A review of the origin and history of mankind would logically lead up to the present status of man in the living world and hence to the destiny of mankind. Modern science is changing the environmental setting of man at an ever-increasing rate. This calls for active and continuous readjustments (adaptation) both physically and psychologically. Here human biology through the study of emotions can arouse a better social conscience since it can formulate new social standards. For example, nutritional deficiency could be eliminated in a measurable time from Europe, as shown by Sir John Orr. It would not take much longer to do the same thing in the British Colonies, as shown on several occasions lately by Lord Hailey, though it can and should be tackled. Eventually nutritional deficiency could be attacked and eliminated from the whole world, as envisaged by Mr. J. G. Winant.

So-called abnormalities in man are now much better understood than they were at one time. They have been in many cases set free from mythical and magical taboo, and are known to be psychological or hormonal. Knowledge of the causes of such abnormalities would bring a more practical and less sentimental sympathy from the general public and especially from those in authority. A more rational view of what is right and what is wrong would surely be the outcome of all this. This aspect of human biology could not be included in courses for children, but should certainly be studied by teachers so that they may be adequately equipped to deal with situations as they arise.

Human biology has given a fresh and more balanced approach to personal evaluation and character training. It would equip the teacher himself with a better insight into the character (normal and abnormal) of his pupils. It would liberate the vexed question of sex from the ignorance, taboos and emotional complexes by which man is hemmed in socially.

Thus it may be said without much fear of contradiction that human biology is lifelong and continuous. Some will go so far as to say that it should displace academic biology (as at present formulated) in education. But even the most moderate will agree that man and mankind ought to receive major consideration in any comprehensive general biology syllabus; yet he does not. Places where human biology might well be introduced are chiefly the teacher training colleges and departments and the junior and senior schools where there is no domination of an external examination syllabus. It is a difficult subject to teach, much more difficult, for example, than higher mathematics, and few teachers are at present mentally equipped to deal

with it. In spite of this, however, it should be developed because (a) it is far more effective in facts and ideas; (b) it is far more interesting; (c) it relies less on detailed routine laboratory experiments but leads to demonstrations and experiments on the self, and other interesting activities such as visits to farms, water-works, hospital laboratories and to talks by such social biologists as medical officers of health, nurses, etc.

As expressed in the Autumn issue of *Biology* (7, No. 2), there is a strong case for the study of human biology, in which man himself becomes the centre of interest, seen against the background of all the living matter to which he is related, and of the material world. Human biology grows out of nature study and academic biology, which still dominate our text-books and syllabuses; but it is something of more entrancing interest, at once more personal in its application and of far greater educational worth. For the problems of human biology confront us at every turn: problems of individual and public health, of nutritional standards, housing, population movements, of race and nation; problems of family life, of the relations and responsibilities of one person to another, and of the social policy of the State. Human biology brings up questions of personal conduct, of moral values and character formation, and of the most intimate relations between one individual and another. Penetrating further into the realm of the mind, we are faced with problems of the ethical basis of philosophy and of the ultimate ideals of life itself. Here we find vistas opening out inviting action, and leading to further inquiry, especially in the universities, for on many of the burning questions of human biology no clear decision has yet been reached.

Yet in nearly every case existing knowledge is decades ahead of educational practice, and we have before us the immense task of trying to make good the lag between general opinion and what is already known. But the function of human biology does not end at being an academic discipline, for it must be given effect in public administration and national policy, since national policies are the mass movements of mankind. How deeply involved human biology is in national policy comes out clearly in this present war. The whole policy of the Fascist powers rests on conceptions of human biology which were disproved by the leading biologists of the world some decades ago; while the conceptions themselves spring from human attributes and environmental conditions no longer holding full sway in the countries of their origin. By contrast, the Democracies, often almost unconsciously, all too tardily, are in the process of putting into action what is best in biological knowledge, as, for example, in the schemes for free milk, health protection, etc.

Yet in all this, little help is forthcoming from our universities and educational authorities. Only as it were by chance do we come across pointers which show the way, as during the Conference on Science and World Order recently held in London. The widespread apathy with regard to pressing problems of human biology affecting the nation's future is a sad reflection on the ideals for which we are at war. But the outlook for human biology now is more favourable than it has been for a very long time.

Only one or two points have been made here in the attempt to show how important human biology is to educational principles and practice. Like any other

subject it has special applications in special cases and emergencies, and it certainly has its novel and unique problems during war-time. There is scarcely any need to enumerate the special war-time problems which are worthy of consideration from the point of view of human biology. A mere mention of a few of them is sufficient to give basis for later discussion. For example, the whole problem of evacuation. This was one of the most successful sociological experiments of our time, when it first took place; that is so far as the organization of the actual evacuation itself is concerned. But there seems to have been very little consideration of biological and psychological aspects of the case in the reception areas themselves. Authorities, for example, apparently underestimated the strength of parental affection, or overestimated parental self-control. Insufficient regard was directed to the emotional unity of the family, and as little to its economic unity. That is one of the main reasons why the initial success of the scheme has since been generally negated in a large number of cases. Another problem is that of broken homes and broken family life caused either by evacuation or the calling up of menfolk and of women into the Fighting Services or movement of women and men to other industrial areas. Emotional tension due to the War has received a certain amount of study by the Ministry of Health, chiefly from the medical point of view. Certain psychological studies have also been made, but the problem as a whole has not received the attention which it deserves. The effect of the War on young adolescents is also deserving of attention, especially in the many cases where abnormally high wages are being paid to young boys and girls. These are just a few examples of special problems raised by the War, and there are no doubt many others, all of which come within the purview of human biology.

At no point in the nation's history have young

people had such independence and freedom as to-day. Never before have they had such opportunities of following the wrong lines of individual and social development, but complementary to this, never has there been such an opportunity for teachers to offer correct guidance. Never has there been such opportunity for building up the characters of the younger generation on a foundation of true knowledge of personal worth and thus preventing them from being lured away by the cheap type of personality appeal in which an individual is singled out for the special favours of fortune. Emotions come before understanding and personal success bears no relation to the common good. So much nowadays depends upon mutual sympathy and understanding particularly between the opposite sexes. All this was shown only recently by messages sent by the Prime Minister and others to the great International Youth Rally recently held in London telling youth of its responsibilities towards the nation, but we must also realize that youth in a social sense has definite claims upon those of maturer years and this is one of them. That youth deserves our help goes without saying, but how we are going to carry it out is a matter for discussion. That youth can be misguided *en masse* has been shown by Nazi Germany where the Hitler Youth, probably through no fault of their own, may now be considered to be workers of iniquity and of primitive passions. If it is possible to organize and misguide youth, then it should be equally possible to organize and guide youth along the right lines. This could be done through the school, youth organizations, etc.; but the unit of the family itself must never be ignored. It is necessary to impress upon youth the biological principles of family life and to make them realize as few do that (as Cardinal Hinsley pointed out in a recent stirring address in Westminster Cathedral) the dignity of the family is not wrapped up solely in the begetting of children.

ISLAND FAUNA RESEARCH

THE University of Oxford, since 1938, has contributed towards the cost of research into the problems of island faunas, with special reference to the Pacific, and, in particular, the Marquesas Isles.

Mr. E. P. Mumford, of Jesus College, who is conducting the inquiry, has made it one of his chief aims to obtain publication of faunistic lists by experts, so that information may be collated and available. An important recent publication from the Smithsonian Institution (Misc. Coll., 99, No. 8; 1941) by Prof. Jackson is a check-list of the terrestrial and freshwater Isopoda of Oceania. This was made possible by grants-in-aid from the contributions of the Royal Society and the British Association to the central fund at Oxford, and from the publication committee of the University of London. The paper contains a noteworthy discussion of the whole subject in which Prof. Jackson concludes: "The assumption of land connections between the islands is gratuitous and would seem to provide more time than is necessary to account for the comparatively small range of differences observed, while the assumption that man is responsible [for the distribution of the Isopods under review] would seem to provide too little."

Other lists that have been published in connexion with the activities of this research include, among

Insecta, the Collembola, Dermaptera, Embioptera, Anoplura, Mallophaga, Homoptera (Cercopidae), Neuroptera, Coleoptera (some Adephaga, Polyphaga-Diversicornia, Lamellicornia, and Rhynchophora), Hymenoptera (Cynipoidea, Formicoidea, Serphoidea, Bethyloidea and Anteonidae), Diptera (some Nemato-cera, Aschiza, and Pupipara), and Siphonaptera. Among Crustacea, the Amphipoda; among Arachnida, the Chelonethida. These lists have appeared in publications of the Bernice P. Bishop and other museums, and in scientific journals.

The recently published fourth volume of the Proceedings of the Sixth Pacific Science Congress at San Francisco in 1939 contains, among other contributions to faunistic questions, two papers by Mr. Mumford on the present status of studies of faunal distribution with reference to oceanic islands, and on the present status of knowledge of Polynesian freshwater faunas. A preliminary account of an investigation of the Euploeine butterflies of Melanesia is contributed by Prof. G. D. Hale Carpenter.

Those interested in furthering this investigation by observations or records, or desirous of obtaining information, are asked to communicate with Mr. E. P. Mumford, Box 802, Stanford University, California, or with Prof. Hale Carpenter, University Museum, Oxford.