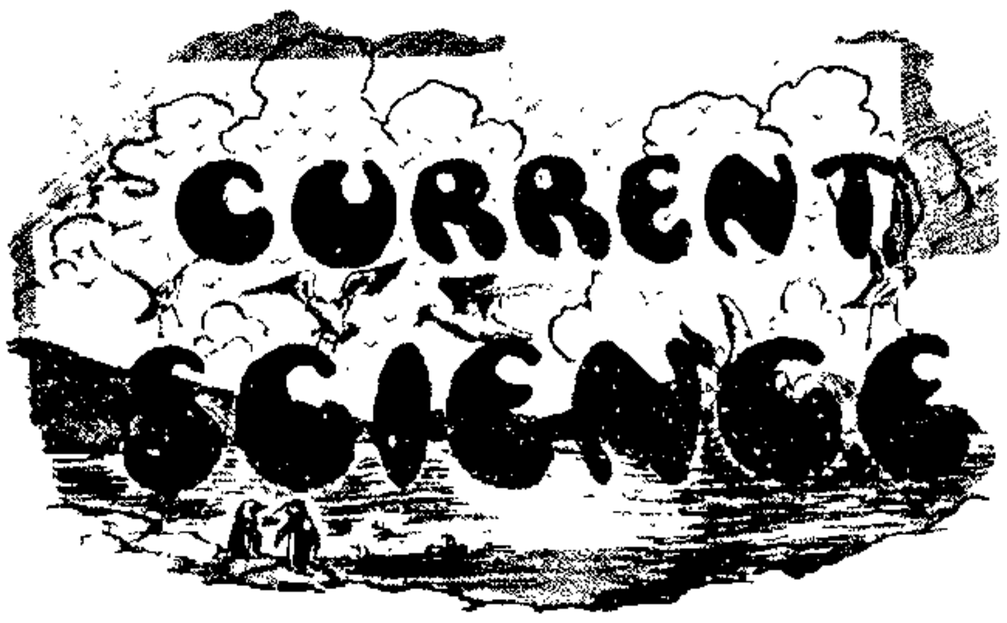

Vol. III] APRIL 1935 [No. 10

CONTENTS.

Nutrition Research in India.

THE contributions of Major-General Sir R. McCarrison to our knowledge of nutrition in India form an impressive record of great scientific and practical value, and his retirement from service about the second week of last month has deprived this country of a devoted scientist whose selfless labours have won for him not only public recognition but the personal esteem of all who have come into contact with him. His researches on the thyroid gland in health and disease opened a new and fruitful field of enquiry into the science of nutrition and it is perhaps with this branch of knowledge that Sir Robert McCarrison's name will chiefly be remembered by posterity. He is probably the first medical officer who formulated a synthetic conception of the effects of faulty food on animal organs and tissues in relation to the endocrine regulations of metabolism. As early as 1919, he observed that faulty nutrition led to the degeneration of the cellular activities of the gastro-intestinal tract and a general lowering of the digestive capacity, which, besides diminishing the economic efficiency of man, exposed him to the insidious attacks of disease. This is undoubtedly a significant contribution to our knowledge of the rôle of nutrition in preventive medicine. In fact the latest investigations which have built up our knowledge of nutrition are detailed amplifications of the facts emphasised by Sir Robert McCarrison in his *Studies in Deficiency Diseases* published in 1921; and his other works such as *The Life Line of Thyroid Gland* and *The Thyroid Gland in Health and Disease* form an illuminating chapter in the history of medical research in India.

The medical profession and even the common people recognised from the earliest times the close relationship between food and disease, and numerous aphorisms on the subject testify to the general experience of such intimacy between diet and health. But the science of Dietetics which is comparatively new, is the outcome of the co-operative labours of physiologists, biochemists and medical men, and presents problems of vital importance to economists and administrators. For instance, the question of feeding a heterogeneous population in a country like India must necessarily involve detailed investigations of complex issues of an economic and agricultural

character, and as our information on the actual requirements and standard of national diet is rendered more definite and accurate by the progress of research, then it is obvious that such knowledge is bound to influence agricultural policies. The diet of a people affects their welfare no less than it determines the character of their agriculture. In India the choice of food is limited by religious dogmas, and where the ideal of a large section of the people is to suppress the cravings of the flesh as a necessary preparation for the attainment of eternal bliss, considerations of the energy value of different classes of food and the adequate supply of this energy for the maintenance of national well-being and economic efficiency, are subordinated to religious injunctions. Apart from orthodox sentiment, climatic conditions probably exercise an equally great influence on the choice of food by the people, but, generally speaking, there can hardly be any choice among the poorer class of the Indian population. In a tropical climate the resistance capacity of the people is always poor. This is due mainly to insufficiency of food or to wrong selections, and accounts for the prevalence of certain well-known diseases which assume an epidemic form whenever famine and drought fall upon the land.

The problem of food has a deeper significance for Indians than perhaps for any other nation. The people inhabiting certain provinces have been declared unfit for military service and the ultimate cause of the alleged incapacity is as much due to diet as to the meaningless social customs prevalent among them. The progress of foreign education in India is creating an increasingly large community of cultured people whose food, dress and general habits of life differ from those of their grandparents and of their less favoured countrymen. The general impression is that the cultured Indian is less hardy, and therefore prone to certain types of maladies. In the Pre-British days there was intensive indigenous education in India, but there is no record to show that learning undermined the physical efficiency of even the most cultured among the Pandits and their disciples. The introduction of a foreign system of education differing from the cultural traditions of the people must upset the mental and constitutional make-up of its recipients and the reaction is expressed in diminished functional efficiency and capacity for resistance. Severe strain and anxious suspense attend modern educational methods which, while attempting to enrich the mind, generally succeed in undermining the physical vitality of the younger generation. We have not so far devised any means of combating the evil. The remedy does not lie so much in encouraging games and sports as in the provision of a well-balanced diet for students in order adequately to equip them to cope with the undue mental exertion which they put forth for meeting satisfactorily the unconscionable standards of public examinations. At present the medical inspection of school pupils and college students is concerned more with the detection of diseases from which they suffer, than in the investigation of the causes which produce them. This is not all. A very large body of ministerial officers and officials is engaged in carrying on the sedentary work of government offices, banks and business firms, and they, like the students, suffer equally from deficiency of diet. The poorer classes have no choice, and generally their food is as bad as bad can be. The problem of feeding India is extremely complicated, and Sir R. McCarrison's researches deal with one aspect of it. We still require an authoritative body of scientific knowledge of the physiological value of the different kinds of food consumed by the Indian people, in relation to their occupations, levels of income, the climatic conditions and the general habits and physical constitution of the indigenous population.

In his farewell address which he gave at Coonoor on 18th March, Sir R. McCarrison pointed out that in his laboratories he kept 1,000 stock rats from which, during the last four years, disease was practically excluded by careful attention to three environmental conditions, cleanliness, comfort and food. Race horses and prize dogs are tended with greater love and care than perhaps even Sir McCarrison's rats. But is there any district where 100 school-going pupils enjoy a fraction of the cleanliness, comfort and perfect food which are bestowed on animals? The tendency of modern competitive civilization is that man will sacrifice everything for the gratification of his vanity, and will almost completely ignore what will promote the health and efficiency of human stock. It seems to us that the warning given by Sir R. McCarrison, "The child is made up of what he eats" is a prophetic utterance, for the nation that neglects its children paves the way for self-extinction.

The main problem of the masses of Indian population is what foods they have to buy in order to obtain the greatest possible nutritive value out of a given amount of money each week. We have a vast body of carefully tested information regarding the nutritive value of the various types of food as well as their physiological value, and the experimental researches of scientists have established standards of nutrition. But the great majority of the people either on account of ignorance or of economic reasons are unable to work these standards into their daily meals. Thus the welfare of the nation which depends basically on how its people eat becomes a matter of chance, instead of being part of a definite economic and social policy of Government. The food requirements of a nation must necessarily lead to the carefully planned adjustment of agriculture, but unfortunately agricultural policy in India is not correlated with the science of nutrition. Obviously all these elements constitute a single great administrative problem and what the people want is a plan which is complete, simple and flexible enough to suit different levels of income. A plan such as we contemplate involves the necessary adjustment of production to consumption by families in the home which is the part that means most for the social welfare and the economic efficiency of the working classes. The cultivator therefore has to produce the right kinds and the appropriate quantities of food. On the other hand the consumers must have a definite knowledge of the facts about the diet in relation to health, the standards of food nutrition and the fundamental principles guiding the selection of a diet that promotes health and safeguards against diseases. Every individual is entitled to have an optimum diet though not to a Dukedom. We are thus confronted with the problem of the need and possibility of building up a physically better, healthier and more vigorous population in India by means of better nutrition. The first step in the solution of this question is the consideration of costs, and we have therefore to prepare dietetic patterns at different levels of nutritive content and cost. What we really want is clear and usable statements of the foods to buy and the quantities needed for every class of people suited to their incomes. The scientists have to deal not with the food which an ample purse can buy, but with that for which people have to rake and scrape and count every pie they spend and then do not have enough to go around.

The common practice in India is to cook food containing strong organic acids and alkaloids in vessels made of brass, copper, bell-metal, iron, tin and aluminium at very high temperatures, and cooked food is also stored in these metallic vessels for very long periods of time. The Biochemistry Department of the Indian Institute of Science has been conducting a series of interesting experiments on the effects of food cooked in the various kinds of metallic vessels on the general health and biological efficiency of rats, and the results that have so far been obtained tend to establish that foods cooked in earthen pots promote and preserve the health of rats, while those fed on food prepared in metallic vessels develop a predisposition to ill-health and premature senility. These researches are of the greatest significance to the general public and one of the reasons for the poor physique of the richer and the middle classes of Indian population may be the slow and insidious contamination of food by metals. The prejudice in favour of metallic vessels is too deep-rooted to be removed by scientific researches, and further, this problem is so intimately connected with important metal industries, that sudden discontinuance of all metallic utensils on a wide scale is bound to produce economic dislocation, unless some other lucrative and cheap industry can be substituted in their place.

It may be that nobody in India actually starves in the broad sense of the term, but many Indians live and must live on diets that are an outrage to the known needs of the human organism. The very fact that this basic thing,—adequate and proper food,—is not now within the reach of a large section of our people is a reproach to our social and economic organisation. Nutrition experts have to devise a dietetic plan for poor people which would enable them to secure the full nutritive value out of the foods which they can buy, and which will keep them in health and reasonable comfort. Starting with such a plan, it would be easy to frame other patterns suitable to the different social strata with varying incomes; but the fundamental point is that social justice and commonsense emphasise that every individual is entitled to work, to earn his wages and to eat in order that he might have the strength to gain his bread on the morrow. The case of the school-children

and college students is perplexing. We have no reliable information in regard to the influence of the mental strain and worries on their physical constitution nor do we possess any on the adequacy or otherwise of the food they consume. The general complaint that University education tends to lower the physique of the Indian graduates and that a highly educated person has a diminished capacity of resistance presents an important problem for investigation. Another equally important question for enquiry is why certain races in India are considered unfit for military service. In cases of emergency the State ought to be able to mobilise the whole man-power of the country for defence, and in times of peace, every person must have sufficient strength to protect the honour of his family and his property. Faulty food and the insufficient supply of perfect food must account, at least partly, for the poor vitality and physical strength of this particular group of people. If the whole nation is to be fit and vigorous, then it is clear that food is the starting point.

The question of feeding India for national efficiency is sufficiently important to warrant the creation of certain new departments such as the Bureau of Food Economics and the Agricultural Adjustment Board which would have to work in closer collaboration with the Nutrition Research Laboratories at Coonoor and with the Provincial Agricultural Departments. The first step is to work out a set of figures showing the amount of land that would have to be devoted to various food crops for each of the different dietary plants, assuming that they will be universally used by the Indian population. These figures will naturally include not only crops used directly for human food but also crops necessary to feed the required dairy and work animals. A close relationship has thus to be established between dietary habits and agricultural practice.

Education must go hand in hand with the spread of sound knowledge of diet so as to ensure that every poor family in India acquires enough information to make a correct selection of food and improve food habits. For this purpose the vernacular newspapers and magazines should constantly emphasise the importance of perfect diet and its relation to national efficiency; perhaps the radio will be of immense service in improving Indian dietary as a whole. In their eagerness to be well and to be at their best, people will readily accept misleading information and one of the chief concerns of the new departments suggested, will be the raising of the dietary standards as one of effective propaganda. It is made the easier by the fact that good diet or even optimum diet is not out of line with the average Indian food habits, even though the emphasis may be different. In India, the food of the poor man has to be investigated as carefully as milk has been investigated, and this new work has to define accurately the needs of the poor for various food elements, determine their functions and uses in the body, and perhaps discover, if possible, new elements. This is the only way in which we can plan diets intelligently, weighing both economic and nutritive values. The difference between the diet of the poor man and of the rich man may after all be one of cost, but scientifically there is a unity of interest, *viz.*, the need for well-being. This seems to be the cardinal truth of the body of man as well as of the society of men. The wise management of a family may be an individual's concern, but the maintenance of the national well-being is absolutely the task of government.

Research on Bananas.

AT the instance of the Government of Madras a scheme for the improvement of the Banana has been sanctioned by the Imperial Council of Agricultural Research, Delhi, at a cost of Rs. 74,000, spread over 5 years, in the first instance.

The Banana Research Station will be located at Coimbatore where considerable preliminary work has been done.

The problems of investigation will be the survey and classification of varieties, study of the keeping quality of the fruit, standardisation of the best methods of cultivation, conducting of manurial experiments both for quality and quantity, selection of pure lines involving new and desirable types, methods of transport, study of the banana diseases and their control, preparation of banana products like flour, "fig", jam, preserve, etc.