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THE PLACE OF FOOD SCIENCE AND TECHNOLOGY IN THE CAMPAIGN AGAINST MALNUTRITION

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The place of food science and technology in the campaign against malnutrition: Chairman's opening remarks

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Our symposium today is concerned with 'the campaign against malnutrition'. It may be useful, at the opening of the meeting, to have a brief look at the enemy we hope in due course to vanquish.

We are going to consider malnutrition as it occurs in the so-called underdeveloped regions, that is, in the greater part of the world. The contributions to be presented deal with countries in the Near East, Asia and Africa. We shall find, of course, that there are important differences from country to country, which means that the problem must receive special study in each country, and the measures to solve it be adjusted to local circumstances. Food science and technology must be developed and applied accordingly. But even more striking than the differences are the similarities. In its essentials the story is much the same, whether it comes from Africa, Asia or the Near East. Central and South America and the Caribbean are not represented in the Symposium, but if we had speakers from these parts of the world what they would have to tell us would, I think, fit closely into the picture which the various communications we shall hear today will provide.

Undernutrition and malnutrition are widely prevalent in the underdeveloped regions. For brevity I shall use the term malnutrition to cover both, though there are objections to this, because malnutrition to most people means the results of eating the wrong sort of food rather than the results of eating insufficient food, and in practice lack of calories is usually as important as lack of protein and other nutrients. Evidence about the extent of malnutrition comes from various sources. Food supply and consumption data, obtained from food balance sheets and dietary surveys, bring out wide differences between prosperous and poor countries, suggesting that nutritional requirements are not at present met in the latter. As far as the registration of deaths from deficiency disease is concerned, vital statistics are not much help

because they are limited and inaccurate in countries in which malnutrition is a common cause of death. Infant mortality rates may give some indication, but the predominant factor in high infant mortality rates is dirt, the term being used to denote insanitary conditions generally, rather than faulty and insufficient diet. More significant is the death rate in children aged 1–4 years; there is a good deal of evidence that a high death rate in this age period is closely associated with malnutrition. Data on body-weight may also be informative: the infants of malnourished mothers weigh slightly less at birth than those of well-fed mothers and a falling off in the rate of increase in weight after 6 months of age or thereabouts is characteristic of malnourished communities. Compared with well-fed children, children in such communities increase in weight very slowly on the average between 6 months and 3 years.

But the most important evidence comes from direct observation, i.e. from what doctors have seen with their own eyes. There is an impressive volume of information, coming from many parts of the world, about the prevalence of malnutrition in children attending hospitals and out-patient departments in the tropics and sub-tropics. Almost every month an article which adds its quota of knowledge on this subject appears in the medical press. Here and there clinical observations have been extended by field surveys among rural and urban communities, but more of these are needed. Among recent surveys of interest are those reported in *Protein Malnutrition in South India* (Rao, Swaminathan, Swarup & Patwardhan, 1959) and *Child Nutrition: A Survey in the Parit District of Perak, Federation of Malaya* (Thomson, 1960).

Information from the various sources when put together justifies certain broad conclusions. Malnutrition associated with insufficiency of protein and calories—some workers use the term ‘protein-calorie malnutrition’—is common in nearly all countries where supplies of foods of animal origin rich in protein, and particularly animal milk, are low. It affects mainly young children and ranges in its effects from mere retardation in growth to serious disease and death. Pregnant and nursing women also suffer from this form of malnutrition, but less commonly and severely than young children. Quantitative figures on prevalence cannot be given on a world basis, but there is no possible doubt that the health and development of a large proportion of the world’s children are impaired by faulty and insufficient diet. There are of course other kinds of malnutrition and deficiency disease, differing from protein-calorie malnutrition and each other in their geographical incidence, and in their impact on different age groups and sectors of the population. The classic deficiency diseases, such as beriberi and pellagra, are still with us, but their importance as a menace to public health has declined during the last 30 years. Anaemias of various kinds, partially at least due to dietary deficiencies, produce much sickness and debility in tropical countries. But protein-calorie malnutrition is enemy number one.

The causes of protein-calorie malnutrition are complex and interrelated. Poverty, of course, comes high in the list. Then there is restriction in food supplies, the lack of animal milk in many countries being a familiar example. Infections and parasitic

disease, ubiquitous in the tropics, are so closely associated with malnutrition that, in practice, it is difficult to disentangle the ill-effects each produces. Cultural and social factors are of vital importance in causation. The primary preventive measures are economic development, increasing the supply and availability of the necessary foods, public health measures to combat infections and popular education in nutrition. Economic development lies beyond the scope of the symposium and so does the general development of agriculture, animal husbandry and fisheries through the use of improved techniques. But we are closely concerned with ways and means of influencing and orientating food production so that nutritional requirements are met, and of ensuring that the most effective use is made of the foods that are produced. Food science—which I take to mean the study of foods and food values in relation to requirements—and food technology, wisely applied, are both needed for these purposes.

The following papers describe some of the contributions which food science has made and is making, and give an indication of what it may accomplish in the future; and they also demonstrate the application of food technology in enabling the best use to be made of available food supplies, in utilizing new sources of food, in conserving the nutritive value of foods and increasing their palatability and acceptability, and so on. That is what the symposium is about. Another important theme running through the papers is the need for popular education, which must accompany all other measures to improve diets. Dr Wilson's paper (Wilson, 1961) on the social aspects of nutritional change will have a close bearing on this subject.

Some years ago, after having spent some 10 years in directing nutrition research in India, I remarked that India needed not more nutrition research but food. I said this in a mood of discouragement and take it back, as far as nutrition research is concerned. Our symposium will, I think, amply demonstrate that nutrition research or food science must play an increasing role in the campaign against malnutrition.

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Problems and some solutions: introduction

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One of the most pressing needs at the present time in the campaign against malnutrition (including undernutrition) is for trained specialist nutrition workers sufficiently experienced and qualified to direct nutrition services and to provide leadership for effective action programmes. There has been a tendency to regard nutrition as being primarily a medical subject and though, at the outset of any