

Being a crop of poor Asian farmers, rice was not as attractive as maize for the corporate sector to invest in research in the past. With the spurt in rice research through the application of molecular tools and the demonstrated commercial feasibility of hybrid technology, rice has attracted corporate investments. Expectedly, such investments aim at reaping the benefits through products for profit and denial to poor farmers. IRRI and rice

community hope for 'a shared vision in rice research that provides public sector access and freedom to use modern tools and sufficient incentives to those who invest and invent, develop and deliver new rice technologies'. A recent announcement by Monsanto of its working draft of the rice genome and its willingness to share the data with an international consortium, the IRGSP, is a laudable example of forging public and private sector col-

laboration in rice genomics. Another one is the Golden Rice – a *tour de force* in genetic engineering and the inventor's offer of technology transfer free of cost to select national agricultural research systems for the benefit of millions of rice eaters that suffer from vitamin A deficiency.

**N. P. Sarma**, Directorate of Rice Research, Rajendranagar, Hyderabad 500 030, India (e-mail: npsarma@dr.ap.nic.in).



Vol. IV] AUGUST 1935 [No. 2

### The problem of malnutrition in India

The fact that millions – perhaps the majority – of the people of India suffer from various degrees of malnutrition seems beyond dispute. It is true that more precise data on this question are required – data which can be collected only by dietary surveys, and the systematic physical examination of sections of the population to reveal the incidence of states of malnutrition and deficiency disease. But sufficient information already exists to prove that malnutrition is widespread. If the diets of the majority of the population, particularly of the poorer classes, are compared, even in a rough qualitative way, with the dietary standards put forward by modern physiologists, it at once becomes apparent that the former fall short of adequacy; in general, they are deficient in the more valuable proteins, and in certain vitamins and mineral salts. Again, food deficiency diseases – beriberi certain forms of anaemia, epidemic dropsy, xerophthalmia, etc. – are common throughout most of India. The poor physique and lack of resistance to infection shown by the majority of the population in many parts of the country also suggest that the average Indian diet is a defective one.

It should be realised that this state of affairs is not peculiar to India; that, in

fact, the same problem exists in most countries of the world. Outside Western and Central Europe, North America, Australia and New Zealand, and perhaps a few other fortunate countries, the diet of the mass of the population is not very different in quality from that of the poorer classes in India. Thirty or forty years ago, malnutrition and certain food deficiency diseases – e.g. rickets – were very common in England; it is only gradually that the dietary level of the masses is being raised even in the most prosperous countries. To-day China presents a problem of malnutrition which is as formidable as that of India, and there is evidence that other Eastern countries, such as Java, Malaya, and Japan, are in a scarcely more favourable position. The question of malnutrition in South America has been little studied as yet, but quite recently the authorities of one South American country very remote from India – Chile – have reached the conclusion that dietary deficiency is one of the main causes of ill-health and disease in that country, and are taking steps to investigate and remedy the situation. It may well be that, for a number of reasons connected with religion and climate, the problem of dietary deficiency in India is more difficult of attack than elsewhere, but the difference is one of degree, not of kind. While economists talk of over-production of foodstuffs, the greater part of the world's population would be the better for more food of superior quality to eat.

The problem of malnutrition in the village might be approached by selecting small 'demonstration' rural areas for intensive work. Data about dietary habits could be collected by careful surveys involving a number of families, and subsequently correlated with the 'state of nutrition' of the population group concerned. The exact nature of the deficien-

### FROM THE ARCHIVES

cies in the diet would thus be made apparent. The next step would be to attempt to improve nutrition in the 'demonstration' area by various means – education and propaganda, maternity and child welfare work, improvement in livestock and agricultural production, etc. The chief aim of a public health nutrition experiment of the type outlined would be to investigate the possibilities of improvement lying within the resources of the people themselves. Results obtained in small areas might have a general application throughout the country.

If the public health side of nutrition work is to develop in the right direction, it is essential that adequately equipped research institutions should exist to provide basic knowledge. Nutrition research is being actively carried on at Coonoor and elsewhere, but there is room for extension of existing institutions working in this field and for the creation of new ones. Sir Robert McCarrison, writing in *Current Science* in July 1932, suggested that 'each Presidency or Province should have its own Institute for the study of Nutrition'. The activities of the ideal nutrition research institute should include basic scientific research, systematic surveys of foodstuffs, study of cheap well-balanced diets within the means of the poorer classes, field and epidemiological investigations, and a good deal of propaganda and education work. It should have a department for training public health workers of various kinds.

Researches in animal husbandry, nutrition, agriculture, and human nutrition, and efforts to apply in practice the results of scientific research in these fields, are complementary and directed towards the same end. The greatest possible co-operation between those concerned in these activities is desirable.

W. R. AYKROYD