

The means of fortifying cereal foods are technically simple, but the experience of the past few years has shown that there may be all kinds of difficulties in using them. Several kinds of protein supplements have been used, ranging from the fish protein concentrate obtained by processing fish in bulk to extracts of soya flour. Although the costs of the protein manufactured in ways like these are less than for that from animal products, there are often limits to the extent to which they can be added to grain or flour without impairing cooking quality or taste. The use of lysine as a means of fortifying cereals is predicated on the tendency for most cereal crops to be comparatively impoverished in this essential amino-acid, and the material can be manufactured synthetically even in countries which have not established indigenous chemical industries.

An article in the current issue of the *Harvard Business Review* by Mr Alan Berg of the Brookings Institution nevertheless provides a telling illustration of how many snags there may be in implementing programmes of fortification based on these materials. One of the most obvious difficulties is the frequently large difference of cost between naturally grown cereals of the kind which are grown in developing countries and the manufactured foodstuffs intended to replace them. Thus the hopes for the manufactured foodstuff called Incaparina, an ingenious blend of materials derived from soya beans and oil seeds, have been in part frustrated by the cost, which turns out often to be as much as four times the cost of the flour which it is meant to replace in Latin America.

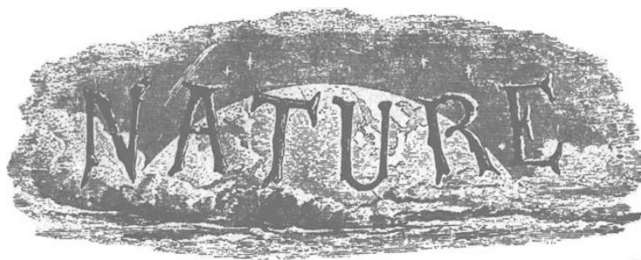
Making sure that the protein supplements are consumed by those who need them most, usually the poorest sections of a community, is another formidable obstacle to this easiest of technical solutions. Indeed, Mr Berg points out that in circumstances in which a population may already be accustomed to spend more than 60 per cent of its personal income on food, as in the larger cities of the developing world, an invitation to buy new protein supplements may have the effect of diverting spending power from other foods necessary to keep body and soul together. From this, of course, it follows that the mere provision of protein supplements is not sufficient, and that developing countries in which protein malnutrition is endemic probably have no way of meeting the social need which confronts them except by developing the kinds of child care services which can ensure that suitable foods are available at the critical times in the course of development, weaning particularly. And this, of course, is the point at which the aid-giving nations should concentrate their attention. If such programmes are to be effective, it is clear that they will have to deal not merely with the provision of protein supplements but with the health care of children in the round. This is merely another illustration of what seems by now to be a general principle—in aid programmes of all kinds, it is uncommonly hard to solve definable problems in isolation.

This is why there is much to be said for an attempt to work out more permanent devices for the amelioration of protein deficiency. Fish protein concentrates and even the products of the chemical industry may have an important role in the years ahead, but with the welfare programmes needed to make full use of them, they are only stop-gap solutions. In the long run, it will be more valuable if ways can be found of increasing the indigenous supply of protein in developing countries. As luck will

have it, at least two important lines of development have recently been opened up. First, plant breeding has made clear that it is possible to increase the yield of essential amino-acids in wheat and other cereals. There is especial interest in strains of wheat now being developed in the United States which contain larger proportions of lysine than more primitive varieties. Further ahead, of course, is the promise of what will happen when the plant breeders turn their attention to the leguminous plants, peas and beans in particular, which already provide large proportions of protein.

There is also great promise in deliberate attempts to improve the availability of animal protein in developing countries, although it will probably be an uneconomical use of resources to aim at setting up in the developing world facilities for breeding, killing and eating cattle comparable in sophistication with those which have made Texas beef a cardinal virtue in North America. But there are also limits to what the oceans will eventually provide—even if the potential yield of pelagic fisheries is much greater than is at present supposed, it is improbable that fisheries will ever yield much more than 150 million tons of fish a year, roughly twice the present harvest of the seas. In the circumstances, there is much to be said for the exploitation of methods of farming fish in fresh-water ponds, for it has already been demonstrated that in suitable circumstances the yield of protein from fish-ponds can be the most economical method of turning solar energy into essential nutrients. This is why the aid-giving agencies which are now—not before time—turning their resources to the problems of malnutrition should spare some of their energy for the long-term solutions.

## 100 Years Ago



Aurora Island

NATURE for May 25 (which has only just reached this part of the world) contains a note respecting the reported disappearance of Aurora Island in the New Hebrides. In that note the small upraised coral island of that name north-east of Tahiti is confounded with Aurora—a high volcanic island—more than 40° to the west of the former. It is scarcely to be wondered at that the mistake should be made when the name of the island is alone given; but when "Aurora Island, one of the New Hebrides group," is spoken of as being to the "north-eastward" of the well-known island of Tahiti one feels surprised at the misconception.

Has it yet been clearly defined to which Aurora the report refers, and is it not more probable that the captain's chronometer was out, or that his reckoning was incorrect, than that either island has really been submerged? A few months ago Dr. George Bennett, F.L.S., of Sydney, New South Wales, showed me a sketch which he made of Aurora in the New Hebrides some years ago. From that the island appears very mountainous, and the map of Melanesia, in Petermann's *Geographische Mittheilungen* (1870), makes it about twenty miles long and 2,000ft. high.

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