

our technology produced an enormous increase in the concentration of this chemical in the world. Natural mechanisms of recombination ensured that these would spread, given the selective pressure exerted. Thus, it could be argued that mere existence is not enough, even survival is not enough; for any element to come to dominate the world there must also be a strong selective advantage and the means for its transmission. It is not widely realised that the Western region of the US is one of the world epicentres of plague, yet this is patently not a serious disease in that country. The reason is not that every plague bacillus in California is securely locked up in a P4 facility but simply that the environmental structure of a modern civilised society is incompatible with the selective propagation of that organism.

These and other issues are still with us, and the story is by no means ended. Yet, in looking back over the past three or four years something positive has been accomplished. The research work

has been allowed to continue, perhaps at a slower pace than many people hoped for; it is the results that are now beginning to emerge that will bring the greatest justification when the tumult has quieted and the dust has settled; and what will remain for the historians of the future will be the insights the technique will have given into the structure of genes in higher organisms. Whether or not any of the other benefits promised by some molecular biologists will have become realised is hard to say. When they appear, however, it will be society and not science that will be judged, because some of us will then want to know whether these benefits are to be used for the good of all humanity or merely to satisfy the selfish interests of some industrial societies. □

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## Rational agriculture

J. G. W. Jones

*The Famine Business.* By C. Tudge. Pp. 141. (Faber and Faber: London; St Martin's: New York, 1977.) £3.95; \$8.95.

In writing about the future of world food supplies, authors are often tempted by one of two easy options: first, optimism that resources will be found to enable mankind to maintain the *status quo*, which in many respects is inequitable and dangerous for large groups of the World's people; or, second, total disaster which could only result in global famine and a massive reduction in population through starvation. Mr Tudge avoids both these extremes and charts a much more difficult course for food production.

He introduces his subject by assailing the myths of population, energy use, and aid to developing countries; there can be no repetition of the economic growth experienced by the Western World since the Industrial Revolution nor a solution to the problems of feeding the developing nations based on technologically advanced agriculture. On the one hand he rejects the idea of the "world farm", where each area of the world specialises in growing what it is best able to, and on the other the idea of national self-sufficiency. The solution he proposes is one of "rational

agriculture" which, considering the difficulties, he defines remarkably precisely as "one that makes best use of the land, while meeting the nation's nutritional needs and gastronomic aspirations." The physical organisation proposed consists of (a) regional specialisation to a degree for beans, cereals and potatoes, and (b) local self-sufficiency for fruit and vegetables together with pigs and poultry fed on plate wastes. Establishing a rational agriculture would be impossible in capitalist systems but what kind of political and economic framework would be best is not stated. Capitalism is excluded on the grounds of its need for continuously expanding economies which are not sustainable in relation to food supplies unless irrational buffers, such as meat production from cereals or food processing, are introduced.

In discussing the nutritional implications of rational agriculture, the author asserts that man has always been omnivorous; any imbalance towards carnivorousness or herbivorousness is due to the omnivorous man's capacity to adapt to circumstances, and especially to the commercial promotion of meat, since the Industrial Revolution. The protein myth is predictably debunked. A plea is made to use the peasant cuisines of the World which were based on austerity and evolved to make palatable and interesting dishes.

The food processing industry is attacked as being concerned with unnecessary operations designed "to impose industrial techniques on food production". Many of its claims are quite contrary to the facts; variety,

seasonality and localisation of food supplies are all lost. Is "convenience" really achieved when time and energy is spent on distant marketing at hypermarkets rather than in the kitchen cooking? Particularly adverse comment is levelled at what Tudge calls "ersatz" foods. The price of meat analogues should be compared with the price of the beans from which they are made rather than with the price of meat; it would then be seen that not only are they inefficient in the use of resources but also uneconomic from the consumer's point of view. The industrial production of single-celled proteins is technologically too advanced for the Third World, and when all is said and done is only suitable for animal feed and thus inefficient.

The book cannot be described as cranky. It is logical and engaging to read, and, except in his attacks on the food processing industry, the author is commendably restrained in his consideration of the implications of rational agriculture for technology and for capitalism. Politics, nutrition and commerce have been mixed with iconoclasm to produce a book which should appeal to the idealist in every reader.

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## Curriculum change and social climate

Mary Waring

*Science Textbook Controversies and the Politics of Equal Time.* By D. Nelkin. Pp. xi+174. (MIT Press: London, Cambridge and New York, 1977). £9.10; \$12.95.

In 1969, the Californian State Board of Education's guidelines for school biology ruled that creation theory, as given in Genesis, be taught as a viable, scientific alternative to the theory of evolution, equal time being accorded to both. The target was, clearly, National Science Foundation-funded BSCS texts, with their evolutionary underpinning, and the ruling represented a victory for local creationist pressure groups. Attacks on evolution were nothing new, and biologists responded only slowly; eventually, however, legal and political strategies seemed to be restoring the situation. Then, a nationally-linked network of creationist activists turned their attention to a NSF-funded social science