

## Manufacturing Food

*Technological Eating or Where Does the Fish Finger Point.* By Magnus Pyke. Pp. 114+21 plates. (John Murray: London, February 1972.) £2.50.

MODERN food technology is a recent development but it has grown and made its impact with amazing speed. We are so familiar with dried, pre-packaged, frozen and instant foods, supermarkets and vending machines that we forget that it is not many years since most housewives baked their own bread, the breakfast cereal was unknown and no one had a refrigerator.

Some of these developments have been and are being directed by social circumstances—the disappearance of domestic help, the working housewife, increasing affluence, the skills of the food producer and the newer techniques of persuasion—at the same time developments in food technology are themselves creating major changes. Technologies of all kinds affect human behaviour and Dr Pyke points out that the effects of food technology are no less than those of communication satellites and nuclear power stations. The slave trade, the history of South America and social structure of many parts of West Africa and the Pacific were greatly affected by food technology.

The slave trade, continuing for three centuries, was created as the result of the need to provide workers for the sugar industry. The eventual loss of the slaves led to the development of the sugar beet in the temperate zone, with long-term effects on the livelihood of cane-sugar producing countries. Bananas took their place as a major food commodity in the late 19th and early 20th centuries but only after the major exploitation of the virgin lands of half a dozen South American States. Margarine, a starting point in modern food technology, led to a search for vegetable oils and changed the complex social life of vast areas of West Africa and the Pacific.

On a more personal scale developments in food technology have altered many of our social habits and cultural traditions, which were often based on a link between man and the soil. When foods come from the factory rather than the farm they tend to be regarded as industrial products rather than cultural factors. When the avoidance of milk produced by cows of another family, as among some Bantu communities, is overcome by detribalized spray-dried milk, the result may well be an improvement in nutritional status. When the avoidance of pork can be overcome by eating simulated pork made from textured vegetable protein the morality is at least open to debate.

Another result, inevitable in the modern business world, is the gross enlargement of the food business. Dr Pyke selects an example of agribusiness near his home, from among the raspberry growers near Dundee. There, the largest acreage of raspberries in the world, the fruit was grown by farmers, collected by school children and sold to jam makers. Now the farmers have gone into business—the plant breeders are developing varieties suitable for mechanical harvesting, the engineers are designing the equipment and the farmers are going into jam-making themselves. The chicken farmer, the supermarkets that manufacture and even grow their own supplies, the mergers and the vertical integration, give rise to the multinational firms that we know today, no less in the food industry than in the petrol and motor car industries. This has changed our regard for food manufacture, much to the regret of many who surround food production with the aura of nature, countryside, leisure and peace, while food processing is regarded as a nasty business. As Dr Pyke says, food manufacture, in many respects, is no different from the manufacture of any other commodity. A side issue is the growing uniformity of food on the international scale—the same breakfast cereal is eaten around the western world and is becoming popular in the east, the same wrapped and branded commodities sold in our supermarkets find their way into the oriental bazaars, and the same baby foods, tea and biscuits, not to mention Cola drinks and whisky.

When we can spin soy beans to resemble meat, when the entire world's needs of protein can be produced in a volume of  $10^{13}$  litres, when the food needs of an entire family for a year can be stored outside the kitchen window in a deep freeze, Dr Pyke asks "where does the fish-finger point?" Will the growth continue—600 million fish-fingers, 1.5 million tons of frozen vegetables, milk that will store for months? He accepts the fallacy of extrapolation and the unpredictability of events; certainly the speed of change makes any forecasts vulnerable. He suggests that growing affluence allows people to choose how they wish to behave and that this may well reverse the current trend to uniformity. Do-it-yourself is not always the result of shortage of money and applies to food preparation as well as to paperhanging. With the same illogic with which the Englishman will eat cow but not dog, will hang game but not chicken, we may well, as a special celebration, forswear the frozen dinner and go to the trouble and loving care of roasting a shoulder of lamb—from meat taken from the deep freeze.

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## Electron Deficiency

*Electron Deficient Compounds.* By K. Wade. Pp. vi+203. (Thomas Nelson: London, November 1971.) £3.95 boards, £1.95 paper.

THERE is an increasing trend towards the publication of shorter specialized student texts, but for such texts to be wholeheartedly recommended they must be unique in the area they cover, and exemplary in presentation. With only minor reservations this book fulfils both these requirements admirably. The discussion of electron deficient compounds appears at some stage in the vast majority of undergraduate courses, and this publication is timely in that it presents, for the first time, a comprehensive coverage of the area at this level.

After a short, but useful, introductory chapter which emphasizes the type of compounds to which the term "electron deficient" can be sensibly applied, there follows six chapters. The first three of these deal with the boron hydrides and their derivatives, covering the structure and bonding of diborane, for the higher boranes and polyhedral systems, and then a general discussion of the reactions of the boron hydrides. The last three chapters deal successively with associated metal hydrides, alkyls and aryls, the carboranes, and finally a pertinent section on other examples of electron deficient compounds including transition metal clusters.

The balance of each chapter is well maintained with the possible exception of chapter 3 where, in determining the charge distribution in the higher boron hydrides, undue emphasis is placed on the simple electron counting method within the various types of three-centre electron-pair bonds. The techniques used in the investigation of such compounds are adequately covered although the use of mass spectrometry is not discussed. Two useful features are the list of references for further reading, and the series of problems, given at the end of each chapter. The answers to the problems are outlined at the end of the book.

The diagrams are clear and well presented, and there are very few printing errors. The  $^{11}\text{B}$  nuclear magnetic resonance spectrum of decaborane on page 40 could be replaced with advantage by a more recent spectrum, and some indication of the frequency at which the spectra are recorded would be useful.

These few trivial qualifications apart, however, this is a reasonably priced book which students at both the undergraduate and research level will find extremely valuable, and it can be highly recommended as an authoritative introductory text for the study of the title compounds. M. G. H. WALLBRIDGE