chemical index. It will appeal to all synthetic organic chemists, whether academics or students. This book stands as a indispensable guide, excellent synthetic reference manual and an extensive source of ideas for further research.

John F. Kennedy
Tracey A. Norris

Biotechnology in the Feed Industry—1994 & 1995. Edited by T.P. Lyons and K.A. Jacques, Nottingham University Press, Nottingham, 1994 & 1995 (2 Vols). viii + 344 & xi + 496 pp. Price £50.00 each. ISBN 1-897676-514 & 1-897676-565.

From its humble beginnings back in the late 1970s, the biotechnology industry has thrived over the last decade and has become an extremely important branch of scientific research and development. Whilst the biotechnology industry has been dominated by the design, development and production of therapeutics, the large scale application of biotechnological methodologies to the agricultural sector has resulted in a number of significant, if not glamorous, advancements.

These volumes present the proceedings from Alltech's tenth and eleventh annual symposiums, respectively, on the application of biotechnology in the feed industry, held in Kentucky, USA. The main emphasis of the tenth symposium was the interaction of nutrition, immunity and gastrointestinal function, focusing on proteinated trace minerals, oligosaccharides and yeast cultures, in this context. Topics involving carbohydrates include the physicochemical properties and nutritional roles of plant polysaccharides in monogastric animals, manipulation of fibre degradation, and the impact of mannan-oligosaccharides on the gastrointestinal microflora and the immune system. The practical application of enzymes in animal nutrition is also discussed in some detail.

The eleventh volume has a slightly more biochemical feel to it with emphasis on mycotoxins, immune modulators and mineral metabolism. However, one chapter is devoted to a showcase on agriculture around the world, with contributions from experts from Europe, Asia, North and South America, and the final section of the book, which comprises just under half of its contents, presents a round-table discussion of an extremely broad range of topics, including additional investigations into a number of the themes developed in the earlier volume, such as the use of mannanoligosaccharides in turkey farming, various biotechnological enzyme applications, and the numerous and varied applications of the yucca plant in agro-biotechnology.

As the global population increases, and consequently agricultural land decreases, the agricultural industry will require an even greater contribution from the biotechnology industry to help solve arising problems through the development and application of natural solutions that are environmentally acceptable to an increasingly aware consumer population.

These volumes thus represent a detailed and extremely important contribution to the development and successful application of biotechnological processes in the feed industry, and will be of value to researchers in industry and acedemia with interests in the biotechnology of minerals, carbohydrates, proteins and enzymes.

Charles J. Knill
John F. Kennedy

Edible Coatings and Films to Improve Food Quality. Edited by J.M. Krochtas, E.A. Baldwin and M.O. Nisperos-Carriedo, Technomic, Lancaster, USA, 1994. x + 379 pp. Price $125.00. ISBN 1-56676-113-1.

The continued increase in the awareness and interest of consumers in areas such as health, foood quality, convenience, and safety have presented food manufacturers and processors with numerous challenges, some of which have potential solutions in edible coating and film concepts. By acting as barriers to moisture and oxygen, such edible coatings can feasibly reduce the complexity and thus improve the recyclability of packaging materials, compared with more traditional non-environmentally friendly packaging, and may be able to replace such synthetic films.

New materials are continuing to be isolated and characterised by food scientists and engineers, many from abundant natural sources that have traditionally been regarded as waste materials. In some cases such materials are being combined/modified in creative ways resulting in the development of novel materials with unusual previously unavailable coating and film properties.

This volume aims to provide a detailed, yet comprehendible introduction for newcomers to the field of edible coatings and films by providing descriptions of suitable materials, summarising their properties, reviewing methods for their application, and discussing their present and potential uses. The volume begins with a general introductory chapter which outlines the characteristics, formation, definitions, and testing methods associated with edible films and coatings. This is followed by three linked chapters which focus on edible coatings for vegetables, minimally processed fruit and vegetables, and processed foods, respectively.

A number of chapters deal with the important area of encapsulation, focusing on flavour encapsulation and the carrying/delivery of food additives, fungicides and natural antagonists. The latter half of the book is essentially devoted to specific classes of edible coatings and films. A general chapter on applications is followed