ticularly enjoyed the articles on opioid peptides (Grossman and Moretti), muscle damage mechanisms (Jackson and Edwards), metabolic fuel utilization during exercise (Bjorkman), oxygen radicals and antioxidants (Packer), the oxygen supply of muscle (Hoper et al.) and muscle adaptations to endurance training (Gollnick).

Hence I feel that the present volume would be of use to many 'sports scientists', because of its broad and clear coverage of many important topics. Perhaps the authors should get together and write a textbook.

B. Halliwell

Advances in Biotechnological Processes, Volume 4

Edited by Avshalom Mizrahi and Antonius L. van Wezel

Alan R. Liss; New York, 1986

xv + 356 pages. £64.00

This is the fourth publication in a series which concentrates on topics in the fields of plant and mammalian cell biochemistry. This volume goes beyond these limits to the extent of including chapters on microbial physiology and classical protein processing.

The first three chapters report on the cloning, expression, purification and properties of human lymphoblastoid interferons. Unfortunately, these articles appear as something of an uncomfortable hybrid between research papers and reviews, having neither the depth of the former nor the breadth of the latter. They are nevertheless informative and well-written.

The fourth chapter ('cell electrofusion', written by Zimmerman, who is acknowledged as one of the pioneers in the field) is a truely comprehensive and valuable review. This excellent treatise covers both the theory and the practise of the technique, with some useful schematic diagrams of experimental assemblies. This development is a prime example of the productivity possible from a multidisciplinary approach to research problems.

Following a review on the biochemistry and immunology of carcinoembryonic antigen, there are two chapters which seem out of context in this book. The first reviews the experimental evidence supporting the possible use of microbial sulphate reduction ($SO_4^{2-} \longrightarrow H_2S \longrightarrow S_o$) as a means of treating industrial sulphate waste. The overall impression from this article is the vast gulf between the current status of experimental work and a commercially viable process operating on a scale of megatonnes per year.

There follows a report on the extraction (but not characterisation) and mode of action of microbial flocculating agents. This provides a good example of the difficulties of defining exact mechanisms when working with heterogeneous and poorly understood experimental systems. Nevertheless, this is an interesting review of a topic which, while being well outside the mainstream of popular biotechnology, has obvious practical applications.

The final two chapters deal with the production of plant metabolites in cell culture and the fractionation of human blood proteins. The latter is a rather dry but comprehensive review of one of the more traditional areas of protein biochemistry. The quality of the figures in this article leaves much to be desired.

If there is one broad criticism of this volume, it is of the diversity of topics covered. It is difficult to imagine that many readers will be deeply interested in subjects as specific and widely separated as carcinoembryonic antigens and microbial flocculants.

This aspect apart, the articles are well-written, well referenced and informative. The illustrations are highly variable in quality, and in several cases, reproduction is sufficiently poor to render them difficult to read. One does not expect typed (or hand-drawn) figures in a text of this quality (and expense).

D.A. Cowan