The products that are highlighted are veterinary vaccines, and this review covers the whole field of bacterial, protozoal, helminth and viral vaccines; enzymes, both in a review chapter on fine chemicals which also includes hormones and in a complete chapter on tissue plasminogen activator production by melanoma cells; interleukins produced from T-cell lines; and interferons. This latter product is given an in-depth treatment taking up nearly half the book. The topics covered are production of human fibroblast (β), human leukocyte (α), lymphoblastoid and immune (γ) interferons. In addition a method for scaled-up purification of recombinant leukocyte interferon (from *E. coli*) using immobilised monoclonal antibodies is described. Collectively this provides a very complete overview of interferon production.

The remaining two chapters review the microcarrier technique for the bulk culture of cells and products from plant cell fermentation. Undoubtedly plants possess a huge potential as a source of valuable chemicals but can this fact be practically utilised? It is apparently feasible but at the moment uneconomic because yields are too low by a factor of at least three and only phosphodiesterase production and digitoxin biotransformation are carried out.

All chapters are informative giving both useful technical and practical information as well as putting the topic matter in perspective with regard to alternative technologies, yields and prospective developments. It is a book for scientists in the field and mainly fulfills a reference role. It cannot be considered as a complete overview of cell biology as it is rather selective. For instance, 5 of the 11 chapters are on interferon, neither human vaccines nor monoclonal antibodies are included, and of the many large-scale culture systems in use, only microcarrier culture is described. The book would have a wider appeal with a more balanced and representative selection of topics. However, this volume is part of an excellently conceived series and, being dedicated to animal (and plant) cells, does highlight the more industrially successful and potentially exciting products. The presentation is good, well indexed and referenced and the figures, tables and photographs are both informative and clearly reproduced.

J.B. Griffits

Molecular Biophysics of the Extracellular Matrix

Edited by Struther Arnott, D.A. Rees and E.R. Morris

Humana Press, Clifton, NJ, 1984

189 pages. £40.65

The idea for this volume emerged from a workshop sponsored by the Biochemical Society and prompted the editors to "... organise a coherent, critical survey of the field...". Their aim, however, was not to prepare a transcript of the proceedings but to produce an original treatise which would "... provide a strong foundation for studies of the molecular biology of the extracellular matrix in years to come." This aim is admirably met and the book is highly recommended on this basis alone.

This book is a collection of seven chapters by internationally renowned authorities who have carefully evaluated the literature and presented a critical assessment of data obtained by various physical and physico-chemical methods. The outcome is a clearly written and well organised review of contemporary research on the molecular shapes, interactions and biological significance of glycosaminoglycans and proteoglycans.

Two of the chapters describe the use of *X*-ray diffraction and NMR spectroscopy for studying

glycosaminoglycan shape and conformation and show clearly how the ordered structures seen in the condensed phase can be extensively modified in solution. The hydrodynamic studies described by Charles Phelps also emphasize the conformational ordering that can occur in solution and, to the question he asks at the beginning of the chapter, "Have we obtained good value for our money in hydrodynamic studies...", I would answer "Yes!". The contributions by Hardingham and by Fransson et al., who would qualify under Phelps' definition of "...those toilers at the mill where centrifuges, viscometers and light scattering photometers abound...", are excellent reviews of the higher levels of organisation that glycosaminoglycans and proteoglycans can achieve through self-association and aggregation.

In short, this is a book that should be in the library of all groups investigating the biochemical and biophysical properties of the extracellular matrix.

M.T. Bayliss

Free Radicals in Biology and Medicine

by Barry Halliwell and John M.C. Gutteridge

Clarendon Press; Oxford, 1985

xii + 346 pages. £30.00

This book will, I believe, be used and appreciated by many readers, including students, chemists, biochemists, biologists and clinicians. In the preface the authors say that the book is aimed mainly at the latter two groups and, for this reason, it assumes virtually no knowledge of chemistry and attempts to lead the reader as painlessly as possible into an understanding of what free radicals are, how they are generated, and how they react. To this end, the first two chapters are concerned with a general introduction to the properties of oxygen and of free radicals and with the chemistry of oxygen radicals and other oxygen-derived species. There is also an appendix at the end of the book that contains further information on atomic structure and bonding.

The other six chapters provide readable accounts of the roles of radical reactions in a number of biological systems, viz. lipid peroxidation in membranes, protection against radical damage in plants and in the eye, free radicals in toxicology (including sections on herbicides, cigarette smoke and ethanol), free radicals as useful species (phagocytosis, prostaglandins and lipoxygenase products) and free radicals in aging and disease (autoimmune disease and cancer).

The authors also offer many incidental pieces of useful advice to readers who are making their first experimental ventures in the free radical field. For example, they caution users of xanthine oxidase as a laboratory source of the superoxide radical of the presence of proteases in commercial preparations of the enzyme. In relation to methods for measuring lipid peroxidation, they comment that whatever method is chosen, one should think clearly about *what* is being measured and *how* it relates to the overall lipid peroxidation process and, whenever possible, two or more different assays methods should be used.

A small criticism is that some confusion may arise from the fact that the superoxide radical is consistently referred to as O_2^- rather than as $O_2^{\cdot-}$. Some readers may also wish that the authors had not chosen to omit all references from the text, particularly as one is not always able to follow up observations and theories that are attributed in the text to individual workers by consulting the quite extensive and otherwise useful lists of original

The scientific journal Free Radical Biology and Medicine is included in the Scopus database. Based on 2018, SJR is 2.22. Publisher country is Netherlands.Â Paper quality checking service is in demand among researchers who wish to make final improvements to their work before submitting it to the target journal.The experienced editors of ORES, who have published papers in cited journals, with the participation of foreign partners go through finished articles. They perform complex checks on many parameters, improve the structure and logic of content, and conduct spell checks, among others. SCOPUS classifier. 1303 Biochemistry. 2737 Physiology (medical). Other journals in category. ISSN. Title. Indicators. Free Radical Biology and Medicine 0891-5849. Journal Abbreviation: FREE RADICAL BIO MED Journal ISSN: 0891-5849. Year. Bioxbio Journal Impact*. IF. Total Articles. Total Cites. 2018/2019.Â You may also be interested in the following journals. â–ºPLoS One. â–ºFree Radical Research. â–ºJournal of Biological Chemistry. â–ºOncotarget. â–ºFaseb Journal. â–ºAntioxidants & Redox Signaling. â–ºEmbo Journal. â–ºCell Death & Disease. â–ºFEBS Journal.