

BOOK REVIEWS

Biochemical Engineering III

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Annals of the New York Academy of Science, vol. 413, 1983,
562 pp.

This volume contains most of the papers presented at the Third Engineering Foundation Conference on Biochemical Engineering held September, 1982 at Santa Barbara, California. The main topics at the conference included: (1) applications of genetic engineering, (2) bioenergetics, (3) process modeling dynamics and control, (4) separation and purification processes, (5) tissue culture, (6) microbial production of fuels and chemicals, and (7) design and operation strategies for bioprocesses. The papers in this volume are grouped together roughly according to these topics, but without any subdivisions to assist the reader interested in a particular topic. A related major shortcoming is the absence of a subject index. Topics one and six occupy a large proportion of the volume.

In reading through the book, it is very difficult to get a sense of the major problems as well as the status of any of these seven topic areas, with the possible exception of topic one. The book serves as an archive of the detailed topics that were presented at the conference and as such will be of interest to persons working on these and other closely related topics. However, the Engineering Foundation Conferences are supposed to develop some overall perspective as to the status and major problems that hinder progress within the conference subject area and hopefully to generate new ideas on how to address these problems. One would then like to see this perspective and overview incorporated into the published proceedings of the conference. A short summary of each of the seven topical areas, giving the status and problems and how the various papers fit in, would have made the volume much more useful.

In spite of these shortcomings there are several papers that are worthy of special mention because of the anticipated wide interest in the topics or because of a novel approach. The subjects of these papers are as

follows: DNA manipulations with *Streptomyces*, *Actinomycetes*, and *Bacillus stearothermophilus*; mathematical models for biofilm fluidized bed fermentation reactors and for the importance of hold time in mixed culture fermentations; reactor design for protein precipitation and centrifugal separation; equipment for semi-works-scale concentration and disruption of *Bacillus* strains; microcarriers for commercial-scale fermentations with anchorage-dependent cells; large-scale processing in plant cell culture; and fluidized bed reactors with flocculated cells for ethanol production. A major paper on the kinetics of neuromuscular transmission at the nerve-muscle junction of higher organisms seems quite out of place in this volume.

The volume will be of interest to persons working in applied microbiology, fermentation, biofuels, and related areas of biotechnology, especially for semi-works- and larger-scale processing. The diversity of topics and timeliness of some of the papers makes a perusal of the table of contents recommended reading for those interested in biotechnology and biochemical engineering.

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Intracellular Calcium: Its Universal Role as Regulator

by

ANTHONY K. CAMPBELL

J. Wiley and Sons Ltd., 1983

A. K. Campbell's treatise on *Intracellular Calcium* is a commendable achievement. To cover a topic as active, broad, and diverse as "the universal role" of this alkaline earth ion as regulator of cellular activities in a clear, coherent and useful volume is indeed remarkable. In the 550 pages of this book the author goes briefly through some general facts characterizing calcium to methodologies of monitoring its concentrations and fluxes and then dwells on "the chemistry of biological calcium." This chapter (3) might have been better placed at the very beginning of the book, after the general introduction. In later chapters the specific roles of Ca^{2+} ions in different types of cell and tissue functions are described and discussed. These range from electrical activity of cells to their motility, intermediary metabolism, endo-and exocytosis, development, and reproduction, ending with the pathology and pharmacology of this ions activity.

A large number of drawings and figures make the reading and following of the text easier and attractive, especially to students. Naturally it also makes the volume heavier. Still the net outcome is a good balance that will provide a broad range of readers with a useful introduction and reference book to a very exciting field of research.

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Handbook of Plant Cell Culture, Vol. 1

D. A. EVANS, W. R. SHARP, P. V. AMMIRATO,
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*Macmillan, New York, 1983; xii + 970 pp.; ill.; species and
subject index.*

In the past two decades Plant Cell Biotechnology has seen a rapid development that has already resulted in some agricultural and industrial applications. This has only been possible through the innovation of a great variety of plant cell culture techniques and their marriage with such disciplines as genetics, physiology, biochemistry, cell biology, plant breeding, and anatomy. The growing importance of plant cell cultures in the development of future crops, and as synthesizers of expensive products, makes a reference work in the field both timely and necessary.

The first volume in a multivolume treatise presents in 35 chapters the basic and specialized techniques of plant cell culture as well as modifications and applications of these. Each chapter contains a critical review, as well as a cross-section of references on the subject. Of particular value are the detailed protocols describing many of the techniques reviewed. Finally each chapter concludes with an in-depth discussion on the future prospects of these techniques that should not only be of interest to the scientists among the readers, but also to those concerned with agribusiness and biotechnology ventures.

It is regrettable, however, that only two chapters are devoted to the use of plant cell cultures for the production of valuable metabolites. In view of the recent developments in this field, a broader coverage of techniques, particularly applicable to biosynthesis and biotransformation should have become an integral part of a Handbook of Plant Cell Culture.

Aside from this omission, the editors, together with the authors of the individual chapters, have succeeded in gathering widely scattered in-

formation and presenting it in a clear and well-organized manner, making this volume a valuable sourcebook for everybody interested in plant cell culture and its application.

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