brates) useful to have at hand. Seventy-five pages are devoted to bacteriophages (morphology, amino acid composition, and typing).

The methodology section consists of articles on subjects ranging from sterilization techniques to characteristics of electron microscopes. Some of the presentations are superficial and incomplete. One might have expected more solid fare here.

The question arises: "Is there a real need for a *Handbook of Organismic Microbiology*?" I suspect that since the publisher has brought forth handbooks on biochemistry, clinical laboratory procedures, laboratory safety, analytical toxicology, environmental control, and the like, he would consider it rational to also supply one on microbiology. Some kinds of subject matter are easier to cast into "handbook format" than others, and it seems to me that general microbiology is an almost intractable one to treat in this manner. What is the purpose of a handbook? If it is to be consulted for instant, readily available, specific and accurate information, certain portions of this book may be quite helpful to a given user, but other sections will be useless to him. A handbook may be "all-inclusive," and since any given individual's interests are (or should be) less than that, large portions of such volumes lie fallow forever—neither consulted nor read. In the area of organismal microbiology, if I understand the term rightly, this book fails to provide sufficient relevant material on ecology, taxonomy, cytology, and microbial symbioses (both ecto- and endo-). Perhaps these areas are simply not amenable to expression in tabular arrays?

Based upon the contents, and price, of this volume, I suspect that mainly college and university libraries and microbiology departments will purchase it. Only the more affluent will wish to add it to their personal libraries, and here the question of usefulness and individual requirements and interests arises. My own view is: *de gustibus non est disputandum*!

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Actinomycetales: Characteristics and Practical Importance. The Society for Applied Bacteriology Symposium Series No. 2. G. Sykes and F. A. Skinner, Editors. Academic Press, New York, 1973, 339 p., \$14.75.

This volume contains papers presented at a symposium held at the Loughborough University of Technology in England in July 1972.

Most of the contributors are from England, and this book underlines the fact that a great deal of fine work on actinomycetes is presently being carried out in England.

Subjects covered in this book include Taxonomy and Classification, Fine Structure, Genetics, Ecology, Pathogenicity, Physiology, and Secondary Metabolites of *Actinomycetales*. This review will be limited to comments on those numerous parts of the book which are of interest to taxonomists.

The introductory comments of David Gottlieb include a report on "cooperative taxonomy," which he refers to as the "socialization of taxonomists." In the case of the International *Streptomyces* Project, the result has been the publication of the description of some 450 strains of actinomycetes that had been described as members of the genus *Streptomyces*.

The most important taxonomic paper in this book is a monumental review on the taxonomy and classification of the actinomycetes by T. Cross and M. Goodfellow. No one interested in actinomycetes should be without this 100-page paper, which by itself is reason enough to buy the book. The actinomycetologist will find there a gold mine of information as well as some original thoughts, such as the redefinition of the family *Thermoactinomycetaceae* and the introduction of the family *Thermomonosporaceae* for actinomycetes with a Type II cell wall producing spores singly, in pairs, or in short chains (*Actinomadura*, *Microbispora*, *Microtetraspora*, *Saccharomonospora*, and *Thermomonospora*). Membership in *Thermoactinomycetaceae* would be limited to those actinomycetes that produce true bacterial endospores. The authors place all such organisms in the genus *Thermoactinomyces* and sensibly propose that the genus *Actinobifida* be shelved. Cross and Goodfellow distribute the various actinomycete genera among 10 families. Unfortunately, no key to these families is included. The genera *Mycoplana*, *Oerskovia*, *Promicromonospora*, *Pseudonocardia*, and *Sporichthya* are considered to be "in search of a family." In the case of most genera, the authors have attempted a detailed presentation down to the level of species. At the end of their treatment of many of the genera, they have appended a number of personal comments which are both welcome and useful.

A review of the ultramicroscopic structure of actinomycetes by S. T. Williams, G. P. Sharples, and R. M. Bradshaw should interest taxonomists in search of useful criteria, since it appears that not all actinomycetes form their cross walls and their spores in the same manner.

The taxonomist will also be interested in D. A. Hopwood's review on the genetics of *Actinomycetales*, since he may have to decide whether two conjugating organisms should be placed in the same species. In addition, if he is concerned with strain improvement, he will find the subject touched upon by Hopwood.

The taxonomist will be interested by W. B. Turner's comments that the actinomycetes' capacity to incorporate intact glucose skeletons into their secondary metabolites makes them more akin to the higher plants than to the fungi. Another difference between fungi and actinomycetes is the relative rarity of the polyketide biosynthetic pathway in the latter group. (It is common among fungi.)

M. Catteau, F. Poncelet, H. Beerens, and J. Losfeld report on a method of separating strains of *Bifidobacterium* into groups on the basis of 50 characters. Also of interest along this line is the report of a panel discussion on techniques for the isolation and characterization of members of the genera *Actinomyces* and *Bifidobacterium*.

The book ends with a short report by D. Küster on techniques for the isolation and identification of aerobic actinomycetes.

No doubt, all those interested in actinomycetes should place this book on their shelves next to H. Prauser's *The Actinomycetales* (Gustav Fischer, Jena, 1970). It should be noted, however, that the publisher, Academic Press, and the Editors, G. Sykes and F. A. Skinner, have shown extremely poor judgment in publishing this book without an index. As a consequence, the considerable amount of information contained in this book will not be easily available to the reader. In addition, the Editors were lax in permitting the use of trade names to refer to antibiotics. On balance, however, the merits of the scientific contributions vastly outweigh the editorial defects.

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