volumes and additions to the present volume will include material on F, P, B, and so forth, even though the corresponding spectra may not have been completely analyzed. The convenient loose-leaf format will make updating and supplementing this compilation an easier task than usual. I am eagerly awaiting volume 2 and updating sheets.

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Mycology

The Fungi. An Advanced Treatise. G. C. AINSWORTH and ALFRED S. SUSSMAN, Eds. Vol. 3, The Fungal Population. Academic Press, New York, 1968. xx + 738 pp., illus. $27.50.

This is the third volume of a work intended to survey present knowledge of the fungi. The main theme of this volume is the fungus population, as distinguished from the fungus cell and the fungus organism, which were the topics of the two previous volumes.

As might be expected in a book of this nature, there is something for everybody. Geneticists, taxonomists, physiologists, and ecologists will all find much of interest, and for the most part the book is well and clearly written at a level the general practitioner in mycology can appreciate. In this respect it is an excellent source book for both teacher and student. With many contributing authors we are treated to a refreshing variety of style. Some skip lightly over their topic, giving us a general review; others take advantage of the opportunity to go into detailed and critical analyses. The change of pace and variety of approach are an enjoyable stimulus to reading the book.

The preface indicates that this is an attempt to relate fungi to their environment, and therefore it is not surprising that most of the early chapters relate to ecology. Nevertheless, the main theme of the book is rather broadly interpreted, so that there is much that is only casually related to ecological aspects of the fungi. For my own interests, I found the last eight chapters, on taxonomy and the evolutionary pattern, especially stimulating.

One of the main faults of a presentation of this nature is that the authors are not always given free rein and may be confined to too few pages. Such is the case with Duddington's chapter on predacious fungi. Duddington has published similar but more detailed articles on this topic elsewhere and I am sure could easily have written three times as much to advantage. In this sense the book sometimes lacks the depth and authority one might expect from a book that bills itself as an advanced treatise.

The selection of chapter topics is not without fault, and some chapters could well have been left out. That on fungi under domestication is little more than a cataloguing of the industrial uses of fungi. At the same time we might wonder why such important modern trends as computer taxonomy and the use of protein analysis as a taxonomic tool have been omitted from consideration.

The book is well organized and remarkably free of errors. There are a few glaring oversights, however. The heading of chapter 27 will give the proofreaders cause to wince, and chapter 9 shifts from "Laboulbeniales" to "laboulbeniales" and back with abandon. These are very minor faults and detract little from a book that will be enthusiastically welcomed as an attempt to bring our knowledge of the fungi up to date on a broad front.

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Biological Chemistry

Molecular Associations in Biology. Proceedings of an international symposium, Paris, 1967. BERNARD PULLMAN, Ed. Academic Press, New York, 1968. xx + 571 pp., illus. $24.50.

Most of the papers presented at this symposium, which was held to celebrate the 40th birthday of the Institut de Biologie Physico-Chimique of Paris, fall into three major categories: structure and function of nucleic acids (11 papers); interaction of aromatic hydrocarbons and heterocycles with nucleic acids (8 papers); and charge transfer interactions (7 papers). There are also eight miscellaneous papers dealing with solvent effects, allosteric effects, antibodies, energy transfer, and membranes. Both experimental and theoretical aspects are well represented.

A theme which runs through many of the contributions on nucleic acids is the question of the nature of the forces responsible for maintaining their secondary structure. K. Hoogsteen ably summarizes a number of studies of hydrogen bonding between purines and pyrimidines in crystals and in solution. The contributions of P. O. P. Ts'o, of I. Tinoco, R. C. Davis, and S. R. Jaskunas, and of Michelson show how thermodynamic, optical, and magnetic resonance studies indicate that purine and, to a lesser extent, pyrimidine bases tend to stack in aqueous solution. Although the forces favoring this stacking have sometimes been called hydrophobic, it is probably better to consider them as arising from dipole-dipole, dipole-induced-dipole, and London dispersion forces. Theoretical work described by B. Pullman and P. Claverie has helped to clarify the relative importance of these various types of interaction. It appears that the stability of the Watson-Crick structure, for example, has significant contributions from all of these types of interaction.

Of the several papers dealing with the binding of polycyclic molecules to nucleic acids, the most interesting one, for this reviewer, was the contribution of D. F. Bradley and S. Lifson, who describe and illustrate the application of a powerful statistical mechanical method to the analysis of the binding of small molecules to polymers.

Charge transfer complexes à la Mulliken have been invoked frequently in discussing interaction between biological molecules, but in most cases there has been a dearth of rigorous evidence for this participation. A number of systems in which good electron acceptors and donors form complexes are discussed in this symposium, but most of the contributors are understandably cautious in attributing the stability of the complexes to charge transfer interactions.

The papers included in this symposium volume are, in general, of a high quality. Some aspects of biomolecular associations are not adequately covered, especially those that involve protein and lipid systems. This is evident from the fact that two-thirds of the volume deals with nucleic acids. Those areas which are dealt with, however, are dealt with in depth. This volume will certainly be of interest and use to the biophysical chemist, the molecular biologist, and the biochemist. The level of the papers, however, is such that the symposium is not a useful introduction for a beginning student or any other person unfamiliar with the area.

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