inhibitory actions associated with about 50 purine, pyrimidine, and ribonucleoside analogs.

Many aspects of this field have already been the subject of reviews, but it is convenient to have this information, derived from more than 1000 references, assembled in one book. Many of the data are presented in tables which classify for the various antimetabolites information on the specific enzymes inhibited, formation of analog-containing "fraudulent" polynucleotides, and enzymes deleted in resistant cells. The sections dealing with incorporation of halogenated pyrimidines into RNA and DNA and the resulting biochemical alterations probably represent the most original of the author's compilations, and provide a valuable summary of the effects resulting from the replacement of a normal base by a structural analog in polynucleotides.

The author's aim is to encourage the chemist to synthesize more useful compounds, to outline for the biologist the role of the antimetabolites in molecular biology, and to relate for the physician the therapeutic effects of the drugs to their fundamental mechanisms of action. However, the extensive individual variations among the drugs make it difficult to predict the biochemical or therapeutic properties of a new antimetabolite. The book is quite brief on the macromolecular effects of the drugs, and a more comprehensive coverage of this area would have provided the reader with a better understanding of current investigational trends. The author has chosen to describe more individual drugs rather than provide greater detail about those few which have been studied more intensively. Coverage of the literature stops in early 1967, but many important references are not included.

Nevertheless, the monograph should be remarkably useful for those who wish to acquire a general knowledge of what has been learned from and about purine and pyrimidine analogs. The specialist will find the book valuable as a source of references and as a guide to the biochemical effects of specific antimetabolites. The reader who has satisfied his academic language requirements by choosing German rather than statistics will be glad he did, since the only section of the book in English is a 7-page summary.

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Bacteria

Biochemistry of Bacterial Growth. JOEL MANDELSTAM and K. MCQUILLEN, Eds. Wiley, New York, 1968. x + 540 pp., illus. $11.

To the teacher of modern bacterial physiology, there is a difficulty in that such a large number of disciplines come together in the study of the functioning of the cell. Where does one start: with chemistry and move toward genetics, or with genetics and move toward chemistry? This book answers these questions in a unique way. The editors, and their nine collaborators, first provide a terse abstract of the entire text, bringing together in a few pages the contents of the book: the structure of bacteria, the growth of cells, intermediary metabolism, the synthesis of nucleic acids and proteins, bacterial genetics, the regulation of metabolism, and spore formation and germination. This is followed by a 60-page section in which the same material is presented at a one-step-more-detailed level. Finally, each topic is again treated separately, in substantial detail, in the nine principal chapters of the book.

The text, directed to the student with only a knowledge of general chemistry, strives to develop a relatively advanced understanding of bacterial biochemistry while at the same time providing an integrated view of the cell. This treatment has the additional advantage that the writers of the specialized chapters can assume the students to have a certain fundamental knowledge of genetics or biochemistry, for example, knowing that they have been through the introductory material. For course work the book seems well balanced in the proportions of its space given to structure, growth, metabolism, and the synthesis of macromolecules and their regulation. Currently exciting subjects, such as genetics, nucleic acid metabolism, and protein synthesis, are treated particularly well. Classical subjects such as bacterial nutrition are omitted. It is an unfortunate omission that after an extensive discussion of glucose catabolism and the tricarboxylic acid cycle there is almost no mention of fermentations, the balance of electrons, and the terminal respiratory chain.

In writing a text for class use the authors have made some concessions. Most notable has been the general omission of historical reference and experimental detail. Where this has not been carried to extreme the result is a straightforward and interesting presentation. On the other hand, at the extreme the chapters on intermediary metabolism and the regulation of metabolic activities become simply compilations of the names of enzymes. Since these same chapters are illuminated with many good figures, the text adds little. Lacking, to choose specific examples, are a general discussion of the use of bacterial auxotrophs, preferential utilization of supplements and isotopically labeled tracers, antimetabolites, and analogs. Since the student must learn that our understanding of the cell is dependent on experiment, and since in the experimental discussions are found inseparably a view of how the bacteriologist works and a view of how the cell works, a somewhat less dogmatic approach would be desirable.

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Chemist's Reference

Nuclear Magnetic Resonance Spectra and Chemical Structure. Vol. 1, The Spectral NMR Parameters of Compounds with Analyzed Spectra. Compiled by W. BRÜGEL. Academic Press, New York, 1968. xvii + 235 pp., illus. In loose-leaf binder. $35.

This collection of high-resolution NMR data fills a definite gap in the analytical chemist's reference shelf. The publication of Brügel's tables marks the first compilation of this kind that is up to date, critical, comprehensive, and easy to use. The organization of the data is lucid; for instance, chemical shifts and coupling constants from proton spectra are given by 88 classes of compounds, a system which I consider of choice for easy reference.

The physical makeup of the book is superb: a loose-leaf binder with 29.7-by-21.1-cm sheets, containing a table of contents, excellently printed tabulations of data, and an index of compounds. The sheets are made of exceptionally strong paper; the two copies of the book which have been in constant use for six months in our laboratory would otherwise have been worn out. Literature searches for material published before 1966, which—in spite of other NMR data collections—have been quite tedious, are now virtually unnecessary, thanks to Brügel's tables.

The bulk of volume 1 refers to protons. Since the accumulation of data on other nuclei has gained momentum in the last few years, I trust that future