

index of over 14,000 entries is provided, which greatly enhances the value of the book for reference.

The criticisms raised here are minor enough when one considers the wealth of information contained in the book, the fact that many of the papers are excellent pieces of work which would stand well in the best of textbooks or scientific journals, and the highly interesting nature of most of the material. The estuary is depicted as a complex, dynamic, and rigorous coastal environment, ephemeral on a geological time scale, sensitive to the impact of civilization, and of tremendous importance to mankind. Scientists interested in estuarine work are not the only ones who will find this book valuable. The article on benthos by Carriker, which is an extremely valuable review for freshwater biologists, and the material on formation of estuaries and deposition of sediments, which should be of interest to many geologists, are two examples among many. Upon reading the book scientists of many kinds will sense the excitement and challenge of estuarine research and management. The limitations to present knowledge of this important part of our planet are alarming considering the pressures being exerted by civilization.

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## On Mycobacteria

**The Bacterial Lipids.** JEAN ASSELINEAU. Based on the French edition (Paris, 1962). Hermann, Paris; Holden-Day, San Francisco, Calif., 1967. 372 pp., illus. \$11.50.

This volume is another in the series *Chemistry of Natural Products*, edited by E. Lederer, which forms a "library" of French publications in the field. Seven volumes have been published in the French language, and five of these have later appeared in English versions.

While the title of *The Bacterial Lipids* is very broad, the content proves to be rather narrow. The most valuable section, and that with the most detailed treatment, is the second part, dealing with branched-chain and hydroxy fatty acids. The very great amount of attention given to the lipid constituents of mycobacteria reflects, undoubtedly, the author's lifelong interest in this subject, but makes the book uneven as a general reference on the subject represented by the title.

The first part of the book, which is concerned with general methods of lipid isolation and analysis, is too brief to be of much use except as a source of leading references. Rather, the reader should simply be referred to the excellent series *Progress in the Chemistry of Fats and Other Lipids*, published by Pergamon Press. The third part deals mainly with phospholipids and glycolipids, and again is slanted toward those numerous unusual constituents of mycobacteria. The last part, on biological properties of bacterial lipids, is too abbreviated (19 pages) to be very meaningful and covers almost exclusively aspects of the immunochemistry of mycobacterial lipids.

The index appears to have some deficiencies. For example, several *O*-methylhexoses are listed in table 41, but only one of them (methylrhamnose) is referenced in the index. The author has made a commendable attempt to bring the revised edition up to date by adding references through 1965.

The general usefulness of this book is hard to assess. Because of the somewhat misleading title, it would be a mistake to urge its adoption as the definitive source for the subject. Were it entitled "*The Mycobacterial Lipids*," it could be given a more enthusiastic endorsement, for on this more restricted subject the book contains much information that certainly will benefit the researcher whose interest is devoted to these strange and chemically complicated microorganisms.

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## Analytical Technique

**Programmed Temperature Gas Chromatography.** WALTER E. HARRIS and HENRY W. HABGOOD. Wiley, New York, 1966. 323 pp., illus. \$11.

At a recent symposium on advances in gas chromatography one of the speakers, addressing himself to a topic in programmed temperature gas chromatography (PTGC), said "it is now easy to know the literature of PTGC." He was referring to the work reviewed here, and his comment was certainly apt. Harris and Habgood have provided a long-overdue and much-needed treatise on PTGC. The literature citations are complete and

thorough, and a whole field is now presented under one cover. But the book is much more than a literature review. It is entirely comprehensive in its treatment of theory, and this is one of its strong points. The authors themselves were the first to present a theoretical treatment of PTGC [*Anal. Chem.* **32**, 450 (1960)], and this interest and concern with theoretical aspects are reflected throughout. The work offers a substantially unified and integrated concept of PTGC and presents a considerable amount of new, previously unpublished material. Contrary to the authors' advice to the reader concerning the possibilities of skipping the theoretical chapters, I would advise the would-be practitioner of PTGC to avail himself of the understanding he can obtain therein, thus acquiring the facility to utilize the techniques more effectively. There are many authors who may contribute to the theory of a topic, but there are few who have contributed and also presented it as lucidly as these authors.

In praising the theoretical treatment given in the book, I must be careful not to detract from the treatment of the experimental aspects, for these also are fully and adequately covered. The authors have done well here in resisting any temptation to provide a lab manual. Instead they have sought to examine the experimental parameters and evaluate their effects. There is no need to justify PTGC to the gas chromatographer. In modern separation science PTGC is probably as widely used as any method available. A sufficient number of selected applications are given in chapter 9, however, to convince the neophyte of the efficacy of the method.

The book is not without its faults. In some instances, the authors appear to have misunderstood the writings of some workers they cite, but for the most part the circumstances are minor. In one respect, the authors seem to have underrated a technique; namely, subambient or cryogenic PTGC. In the separation of very volatile substances and fixed gases this method can do as well as, if not better than, isothermal gas solid adsorption chromatography, the method which seems to have current preference. Introduction of samples by on-column injection at cryogenic temperatures can greatly enhance the separation of trace components from large amounts of diluents. The chromatogram of a slowly injected sample shown in the frontis-