Though far from proved, this hypothesis has accumulated support in the past decade. Dimethoxyphenylethylamine was isolated from the urine of schizophrenics in 1962, and these results have been both confirmed and denied. Two laboratories found that feeding methyl donors to schizophrenics caused an exacerbation of symptoms. New psychotomimetics have been synthesized, and these typically contain an *N*-methyl group.

This volume represents an effort by the major investigators in this country and abroad to evaluate established results and to delineate existing problems and directions for future research. The meeting was organized by the three editors, whose laboratories have made significant contributions to this line of research. The chapters, representing individual presentations at the meeting, are grouped more or less logically, and an edited discussion follows each group of three to five chapters. The discussions are particularly valuable when results reported in the papers conflict, as they do on the question of the existence and meaning of dimethoxyphenylethylamine in urine of schizophrenics.

The papers are of high quality; hypotheses and results are set forth cautiously and discussed critically. The papers present previously unpublished material or summaries of several years' work by a laboratory. Four clinical papers concern 3,4-dimethoxyphenylethylamine. Since one of the authors is unable to find this compound in the urine of schizophrenics on a plant-free diet, its origin, methods for its analysis and identification, and the enzymatic methods for its production are discussed vigorously. In another group of clinical papers the metabolism of tryptophan in normal and psychotic subjects and its relationship with methionine are discussed.

The remaining papers deal with animal research, analytical methods, or theoretical material. Smythies discusses the effects of mescaline and its derivatives on conditioned avoidance responses; and Himwich, the effects of psychotomimetic *N*-dimethylamines on the electroencephalograms from different regions of the brain in rabbits. Straughn presents interesting data showing that norepinephrine, serotonin, and dopamine have a depressing effect on limbic neurons. Szara discusses relationships between the structure and action of methylated tryptamine derivatives and also offers an extremely interesting computer-based theoretical model of brain function, suggesting ways in which the model might be altered by drugs or in schizophrenia to produce psychological deficits. Holmstedt presents work on the separation and analysis of psychoactive amines by gas chromatography. Baldessarini describes a novel method for the assay of *S*-adenosylmethionine and shows its alteration with drugs; and Snyder correlates electronic configuration and hallucinogenic potency. Kety offers a succinct summary of the proceedings, emphasizing the heuristic value of the transmethylation hypothesis.

The volume has an excellent bibliography and index and is thus valuable not only to psychiatrists, pharmacologists, and biochemists who are superficially interested in this subject, but also to active researchers. However, specific psychological deficits produced by psychotomimetics and the degree to which they produce a condition resembling schizophrenia are hardly touched. Similarly, the specific nature of the exacerbations produced by methyl donors is not described, nor are the acquisition of tolerance to psychotomimetics and its implications for an endogenous toxic hypothesis even considered.

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Coastal Waters

Estuaries. A symposium held at Jekyll Island, Georgia, March–April 1964. GEORGE H. LAUFF, Ed. AAAS, Washington, D.C., 1967. 773 pp. illus. $27.

This is a collection of 71 papers presented at a conference held "to provide an opportunity for the exchange of ideas between the various disciplines and individuals interested in estuarine research, to summarize the present knowledge of the natural characteristics of estuaries, and to delineate the direction of current research efforts." A supplemental bibliography contains references through 1966.

As a point of departure, an attempt is made to define estuaries, and their relations to the oceans and continents are discussed. Circulation patterns and their effects on the salinity and temperature structure of estuaries are explained. Natural physical and biological processes important in the formation and destruction of estuaries are discussed. Estuarine sediments and sedimentation processes are treated in considerable detail. Next follow descriptions of microorganisms—bacteria, fungi, algae, protozoa, and so on—in estuaries and discussions of primary production, secondary production, the role of organic detritus, biological zonation, and structure of plankton and benthic communities. Physiological problems especially important to estuarine animals are outlined, and specific examples are detailed. The importance of estuaries to fisheries in various parts of the world is pointed out, and potentials for increased production are discussed. The book ends with consideration of detrimental and beneficial interventions by man through pollution, changes in land drainage, alteration of tidal influence, and direct alteration of the biota.

Over one-third of the papers are reviews or treat estuarine phenomena from a generalized perspective; one-third are descriptions of estuaries or estuarine processes in particular localities; the remainder deal with definitions, methodology, description of research programs, and so forth. As a topic is taken up, articles of broad perspective are followed by reports on specific experiments or examples of phenomena from specific geographical regions. The topics unfold in logical sequence and build well toward an integrated picture of the estuarine environment.

Many of the problems taken up from an estuarine perspective are common to other environments. It seems to me that the relevance of the estuarine case to the general one and vice versa is in some cases not explicitly established by the authors. For example, it is not made clear to what extent sedimentation processes, population dynamics, and strategies for management of harvestable biological resources represent problems unique to estuaries rather than particular cases of general problems.

On the average, the exposition is clear, although a few authors tended to be repetitious or were guilty of poor organization, with the result that their papers are longer than the contents justify. A very few non-estuarine ringers seem to have sneaked in—several of the contributions are scarcely relevant. A fair amount of unavoidable repetition occurs, for example when successive biologists outline the same physical process in preparation for explaining its impact on different groups of organisms. Information on many topics is widely scattered among different papers, but an effective subject

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-