sentation of the various theories pertaining to ion-exchange and solvent extraction. For example, the conflicting data in the literature pertaining to the application of the Donnan membrane equilibrium to ion-exchange resin systems are well summarized and analyzed.

Since the use of ion-exchange and solvent extraction is rapidly expanding throughout industry, particularly in hydrometallurgy, the up-to-date summary by Marcus and Kertes will be of considerable value to industrial as well as to academic chemists. Although much of the information in the book, particularly that in the theoretical sections, is available in greater detail in several well-written treatises, anyone unfamiliar with the field will appreciate having it available in a single text. This reviewer does think, however, that the authors could well have eliminated some of the general theory, which is available in standard texts in physical chemistry, and added a small section on experimental techniques for measuring distribution ratios; such techniques require considerable care, and few texts or other publications on the subject give the necessary details.

ROBERT KUNIN
Rohm and Haas Company,
Research Laboratories,
Philadelphia, Pennsylvania

Ingested Pathogens

Food-Borne Infections and Intoxications. HANS RIEMANN, Ed. Academic Press, New York, 1969. xxviii + 700 pp., illus. $28. Food Science and Technology, vol. 5.

The editor of this comprehensive volume contributes a chapter on food processing and preservation, and also one on botulism, types A, B, and F. Responsibility for the 11 other chapters is divided among 14 experts. Treatment of the assigned topics is authoritative and up to date.

Insufficient editorial stringency has been exercised to avoid redundancies and imbalances. The review of *Salmonella* and Arizona infections by Joan Taylor and J. H. McCoy contains 24 pages of tabulated data on *Salmonella* types isolated from various sources in the United Kingdom, whereas control of salmonellosis is allotted only one page. R. Angelotti devotes several pages to physicochemical properties of the three or four known staphylococcal enterotoxins, but only a few lines to safeguards against them. Methods of examining foods for *Clostridium perfringens*, described by Betty Hobbs, reappear in a chapter on laboratory methods by J. H. Silliker and R. A. Greenberg. Writing on type E botulism, G. Sakaguchi gives undue attention to his toxin precursor concept and to still unsettled mechanisms of toxin activation. Riemann's account of the other types of botulism suggests rather selective reading and contains a few inaccuracies. For instance, Riemann differs from Sakaguchi in stating there is little or no cross-neutralization among the different toxins and in not recognizing the tendency to shorter incubation periods in type E botulism; and he erroneously implies that all type B strains are proteolytic and that type C strains liquefy gelatin. In the laboratory diagnosis of botulism, the importance of examining vomitus or stomach contents for botulinus toxin or spores is nowhere mentioned.

Misprints almost inevitably attend such a volume's first appearance, but in this one there are also less excusable literary lapses, such as "may well signify" instead of "may well authenticate" and "no small wonder" instead of "no wonder." The glossary, though well conceived, is haphazardly compiled. If *D*, *F*, and *Z* values need to be defined, why not Nt, CF, and HI tests? Since caltrops require explanation, how about greaves and menhaden? And if such words as "buccal," "host," "lesion," "nausea," and "pulse" are likely to puzzle the reader, should not "copepods," "heat shock," "organoleptic," and "water values" be on the list?

Included are lucid accounts of parasitic infections, by G. R. Healy and Neva N. Gleason; of poisonous plants and animals, by H. G. Scott; and of miscellaneous microorganisms sometimes implicated in food-borne infections, by F. L. Bryan. Particularly informative innovations are the chapters on viral infections liable to be food-borne, by D. O. Cliver; on halophilic *Vibrio* infections by R. Sakazaki; and on alimentary mycotoxicoses, by G. N. Wogan. This should prove a useful reference volume, but it lacks the historical perspective and unifying influence needed to justify the epithet "monumental" applied too fulsomely in the foreword.

CLAUDE E. DOLMAN
Department of Microbiology,
University of British Columbia,
Vancouver

Optical Interactions

An Introduction to Nonlinear Optics. GEORGE C. BALDWIN. Plenum, New York, 1969. x + 158 pp., illus. $9.50.

The nonlinear response of matter to combinations of photon fields, or of photon and phonon fields, has been studied extensively in connection with the laser. These interactions, interesting in their own right, also afford the prospect of important laser applications such as modulation, beam deflection, harmonic generation, and parametric amplification. In this slim volume Baldwin discusses the principles underlying salient developments in the field. The book is addressed to nonspecialists with a good background in engineering physics who seek a brief acquaintance rather than a thorough familiarity with nonlinear optics. As there is no short road to understanding, this turns out to be a tall order.

After two introductory chapters, the book treats such topics as electro-, acousto-, and magnetooptic effects; optical rectification; Raman, Brillouin, and Rayleigh scattering; traveling-wave second-harmonic generation; parametric, Raman, and Brillouin amplification; birefringent index matching; and self-focusing effects. The treatment relies heavily on verbal descriptions and plausibility arguments rather than mathematical demonstrations. Some of the descriptions (of phase matching and parametric gain, for example) are quite lucid, whereas others (electrooptic effect and Raman scattering) are not entirely transparent and tend to be misleading. Most of the discussions are not carried far enough even for the casual reader. Device applications are not covered at all.

Excessive references can easily cloud a brief review of this sort. Instead of references Baldwin provides a short biblography of review articles and books covering major areas. However, the complete absence of references is disconcerting when special topics are mentioned in passing with no opportunity given for the interested reader to obtain more information elsewhere.

Although the book may provide a mature reader with an indication of subjects covered by nonlinear optics, the student will find that it does not offer enough background and the specialist will find it too superficial.

I. P. KAMINOW
Bell Telephone Laboratories,
Holmdel, New Jersey