Wood, and how this far-visioned man helped to expand the horizons of Watson's thought and plans. Yet Watson must also have met innumerable fools, and his rivals have also met far-visioned men. Rodgers probably lacked the information, as an outsider, to distill the talents and policies which created this empire, but there is no evidence that he recognized the magnitude or nature of the puzzle to be solved. Not elementary, Watson.

Instead we get a potpourri of anecdotal biography, portraying a trigger-tempered, vain, paternalistic man in some of his business, philanthropic, and political activities. This is not rich fare: businessmen lead lives almost as placid as professors', devoid (for professors until recently!) of danger, immensely repetitive from year to year, remarkably empty of amorous exploits or titillating fraud. We might have profited if Rodgers had also looked more closely at Watson, the Chairman of the Board of Trustees of Columbia University. My impression is that Columbia would have been better served by someone interested in higher education even if he needed to be advanced his subway fare to attend trustee meetings. We might have profited too if Rodgers had sought to measure the impact of the government's policies (including antitrust policies) on IBM; on the whole I conjecture that they were highly beneficial. In short, we would have profited if Rodgers could have obeyed that absurd Watsonian admonition that forms the title of this book.

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Nuclear Physics

Third Symposium on the Structure of Low-Medium Mass Nuclei. Lawrence, Kans., 1968. J. P. DAVIDSON, Ed. University Press of Kansas, Lawrence, 1968. viii + 296 pp., illus. $12.50.

This symposium was the third in a series that began in 1964. The smallness of these meetings (about 50 people) allows an informality and a depth of discussion not possible in a larger gathering. The success of the venture can be judged by the call, for the first time, for formal publication of the proceedings. One can only hope that the publicity will not expand future gatherings to a size that makes them ineffective.

The volume consists of the text of all the papers and the discussions. Most of the manuscripts appear as presented by their authors, and no attempt has been made toward uniformity in style. Such a decision by the editor does not detract from the usefulness of the book and is justified in view of the rapid publication.

Over half of the 13 papers presented at the symposium are deep surveys of experimental data on selected nuclei in the ($2s$, $1d$)-shell and the problem involved in getting "simple" interpretations. Two of the papers present subject matter new to the series in that they concentrate on hardware—on the dynamitron accelerators (M. R. Cleland) and heavy ion accelerators (P. H. Rose and W. E. Stark).

Three experimental papers are of note. J. A. Becker gives a review of the use of triton beams on nuclei in the ($2s$, $1d$)-shell with a host of new spin assignments and mixing ratios. A. E. Litherland makes a detailed comparison of properties of the mirror nuclei ^{25}Mg and ^{25}Al—a pair which are unique in being both well studied and exhibiting rotational bands. It is pointed out that one can not only infer from information derived from one nucleus information concerning its mirror, when the information may be difficult to extract experimentally in the mirror, but also, in principle, test to a greater accuracy the nuclear wave functions. P. M. Endt gives what is essentially a continuation of his talk two years previously on the gamma decay of analogue states. It now seems that the earlier interpretation involving the antianalogue states was too naive, and, in the details of fitting, it has been found necessary to retreat to the unsatisfactory solution of invoking different criteria for each nucleus studied.

Those who study low- and medium-mass nuclei are at present making one of their periodic critical reviews of their subject. The physical interpretation of the shell model is now being probed more deeply and the consistent derivation of every operator (interaction, electromagnetic, and others) that should be used is being questioned. Thus it is no longer thought satisfactory simply to parameterize the nuclear residual interaction, and efforts are being made to derive this from the free nucleon-nucleon interaction. In the symposium the direct derivation of the "bare" interaction from the known phase shifts is discussed in talks by J. P. Elliott and D. S. Koltun; it is of interest to see their different approaches side by side. Perhaps it is unfortunate that no talk was scheduled on the G-matrix evaluation from the Brueckner theory—the conflicting approaches would have made interesting reading. The use of the interaction as derived from the G-matrix in the shell model calculations, however, is discussed in a comprehensive paper by Edith Halbert. The problem of further renormalization of the residual interaction arises here again after the need is seen for further truncation of the shell model basis when the full calculation within a shell becomes intractable. The solution so far has been to return to the phenomenological parameterization of the interaction; although the question of the meaning of the phenomenological calculations was raised, no answers were given, in the presentation of the results, for such a hypothesis. One can look forward (possibly at the fourth symposium?) to the setting up of criteria by which one can judge the physical meaning of simple models in highly truncated spaces with phenomenological operators.

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Solution Chemistry

Ion Exchange and Solvent Extraction of Metal Complexes. Y. MARCUS and A. S. KERTES. Interscience (Wiley), New York, 1969. xii + 1044 pp., illus. $44.95.

The authors write that their aim was to prepare a monograph that would be useful to workers in solution chemistry, coordination chemistry, and the analytical and industrial aspects of separation chemistry. Their book, the product of much painstaking labor, fulfills the aim.

The authors treat the theory of electrolytes first, then ion exchange, and finally solvent extraction. They have appended an up-to-date and useful summary of distribution data for the extraction of almost all known metal complexes. A detailed treatment of the general theory of ion-exchange and solvent extraction is included in the chapters on these subjects. Many of the distribution data summarized are critically analyzed. Similar care has been taken in the pre-

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.

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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.

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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.

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