

the understanding of nuclear physics since the publication, 10 years ago, of Blatt and Weisskopf's authoritative book, which satisfied all three of the above purposes. Unfortunately very few books on this topic have been published since then, so I find this one particularly welcome. There is almost no overlap between this book and Blatt and Weisskopf, so that the author is enabled to concentrate on the newer developments. For example, all discussion of the two-body forces (by now a field large enough to spawn a monograph or two on its own) is omitted.

The first chapter, a discussion of the experimental data now available and of the basic theory underlying the derivation, ranges from the nuclear size measurements by electron scattering to magnetic moment measurements. Almost all of this is new material that has become available in the last 10 years. I would have hoped here for a tabular summary of the numbers available, or in cases where the data are too extensive, for a reference to other tabular data. This I find is not as complete as desirable.

In chapters 2, 3, and 4 the author discusses in turn the shell model, the collective model, and the optical model. I find the discussion in each case quite clear; one could again perhaps wish for more references to alternative, and in many cases more thorough and detailed, discussion of the topics.

Chapter 5 returns to the shell model and, in particular, radiative transitions are considered.

In discussions with Russian physicists I notice occasional resentment of the fact that foreign (particularly American) authors ignore their work. One may make the inverse complaint here. Because the majority of the work in nuclear physics since the war has been in America and Western Europe, no Russian book of any use at all can ignore this work completely. But in this volume Russian references are often used in preference to original Western work. For example, the scattering of neutrons by a coulomb field (through the medium of the magnetic moment) was authoritatively predicted in America and experimentally confirmed in Western Europe; yet the author refers solely to a less complete Russian paper.

These failings are minor; I find the book readable and useful, and I am glad to have it on my bookshelves.

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Infrared Band Handbook. Herman A. Szymanski, Ed. Plenum Press, New York, 1963. xii + 484 pp. Illus. \$35.

The *Infrared Band Handbook* is really a collection of bands listed by position in wave numbers. According to the publisher, more than 8500 bands are listed, and by my count these derive from about 1100 compounds. The book should be reviewed by a computer. Lacking an electronic model, this human computer made random checks with three objectives in mind: typographical errors, errors in data, and errors in the selection of data.

A book of this kind serves a useful purpose only if the information presented is accurate. That a check of about 400 bands uncovered only four typographical errors, all minor, gives the book a very good grade for this test. A failing grade must be given with respect to the test on the accuracy of the data put into the book. I checked 12 compounds (about 90 bands) chosen at random and found errors in the bands reported for four compounds. For example, the book lists two bands (1570 and 1566) for cyclobutene and cites Bellamy as the source. Bellamy actually gives only the 1566 band, and there is only one band in this region of the spectrum. A band at 972 is shown as very strong in a 0.036-mm sample, while the American Petroleum Institute (API) files give a medium to weak band at 972 for a 0.065-mm sample. I found a number of similar errors, but lack of space precludes enumerating them here.

When, as in this book, only a small fraction of the available information can be presented, selection becomes critical. The *Handbook* wastes precious space by giving data from too many compounds of great similarity, for example ten α - or β -*n*-alkylnaphthalenes. On the crucial problem of how to present intensities of the various bands the book fails miserably. More often than not the choice of sample thickness reverses, in terms of very strong, strong, and like designations, the true intensities of the bands. Note, for example, the data for *cis*-4-octene, with sample thickness in millimeters given in parentheses: 1650 VS (0.239), 1456 S (0.0153), 1381 S (0.064), 1343 VS (0.239). With a logarithmic relation between intensity and thickness, and three different sample sizes, it is exceedingly difficult to reproduce the true

state of affairs in a single spectrum from these data. When, as is the case with 7-methylquinoline, no sample thickness is reported the relative intensities become meaningless. The handbook gives three strong bands at 885S, 828S, and 799S, but their true relative intensities are M, VS, and not present, respectively.

Since some 60 percent of the references listed are to the API files or to Bellamy, anyone who has ready access to these sources has little need for this book. I can recommend the book only to those who do not have access to more reliable data, and then only with great reservation.

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Mathematics and Chemistry

Chemical Applications of Group Theory. F. Albert Cotton. Interscience (Wiley), New York, 1963. x + 295 pp. Illus. \$12.50.

Chemical Applications of Group Theory is a book from which the average chemist with little flare for mathematics can learn how to apply the results of point-group theory. The author has pared down to a minimum the purely mathematical part of the subject, but at the same time he has provided a large number of examples to illustrate each step. However, in attempting to avoid rigor mortis, he has missed a few points where rigor is required. I do not believe that these are serious, since the examples usually set one straight again. The book is planned for chemists who will not make extensive and sophisticated use of group theory, but who need to be familiar with the notation and simpler results currently used in the chemical literature.

The first section of the book includes a brief chapter on abstract groups, a chapter on molecular symmetry operations, and a detailed chapter on molecular symmetry classification which contains many good examples. The alias and alibi transformations are not explicitly discussed, and usually, but not always, the latter is used. Although only proper and improper rotations are necessary to specify all point-group symmetry operations, the author lists the four conventional types of operation as being fundamental. Representa-