

facts presented. This at times results in the author's taking a stand on some controversial point that may in the end be wrong. Zwikker is apparently willing to risk this for the sake of conciseness.

Broadly speaking, the book develops the field in the standard way. First appear introductory chapters on binding forces and lattice types along with discussion of homogeneous and heterogeneous mixtures. Then follows a good treatment of the anisotropic properties of crystals. In brief, it proceeds from the simple scalar-vector properties (for example, pyroelectricity) to the more complicated tensor-tensor properties (as far as elasticity). This section is the best in the book. After brief discussions of damping (mechanical and dielectric) and plasticity, there follow several chapters on thermal properties and finally several chapters on electron properties.

For its purpose it is well constructed and well illustrated with many line drawings and graphs. It is especially notable for the extensive use of scales to present experimental data concisely. It is written in a good style, although here and there the deletion of one or another "effect" in favor of a section tying together more tightly the previously mentioned "effects" might be advantageous. Successful use of this as a classroom textbook will require frequent use of the many original papers referred to. Perhaps for a student its best use will be its aid in reviewing for comprehensive examinations.

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Elementary Introduction to Molecular Spectra.

Børge Bak. North-Holland, Amsterdam; Interscience, New York, 1954. 125 pp. Illus. \$2.90.

This little book is intended for biologists, chemists, and chemical engineers who increasingly resort to empirical applications of molecular spectroscopy for the solution of their problems and naturally have a desire to understand the phenomena they apply. Such understanding is not easily achieved, however, for the dynamics of molecules and their interaction with electromagnetic radiation are intricate quantum-mechanical processes, and the classification of spectral data is based on group theory. Thus, the author has undertaken a difficult task.

The first chapter is an introductory survey of practical and theoretical spectroscopy. In the second chapter the basic postulates of quantum mechanics are stated, and an outline is given of the derivations of some of the equations used in molecular spectroscopy. The remaining three chapters give a clear and readable account of microwave, infrared, and visible-ultraviolet spectra. Because of the severe limitation of space, many important matters are omitted or treated with extreme brevity (only four pages are devoted to Raman spectroscopy!), and some oversimplifications have resulted. These chapters have been wisely written in such a manner that they are independent of Chap-

ter II. This is particularly fortunate because, in my opinion, this chapter is the least successful. The Hamiltonian operator is introduced in a manner reminiscent of the Danish flag, which, according to legend, fell down from heaven. Moreover, very few of the expressions used in the later chapters are derived, and only for the particle in a box is the derivation approximately complete. A discussion of Bohr's concept of stationary states, with which the theory of spectra began, would be more helpful to the reader than the two tables of hydrogen wave functions.

Despite its shortcomings, which are closely related to its brevity, this book should be valuable, not only to its intended readers, but also to students who desire a quick preview of molecular spectroscopy.

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Geschichte der Mathematik. J. E. Hofmann. Walter de Gruyter, Berlin, 1953. 200 pp. DM 2.40.

This small volume is the first of several giving a brief but thorough sketch of the history of mathematics. It covers the period from the beginnings of mathematics up to the appearance of Descartes and Fermat. The author treats the mathematics of the ancient world with relative brevity and concentrates on the mathematical accomplishments of the medieval world. Although the names of practically everyone who made any contribution to mathematical knowledge are here, Hofmann can do little more than list them. Nevertheless several figures among the ancient and medieval mathematicians have been singled out for detailed treatment.

This book has excellent bibliographic material, ranging from references to works of general cultural history to original textbooks used in the period discussed. In addition, there is an index of the mathematicians mentioned with bibliographic information for each. These features contribute to the usefulness of this as a reference book as well as for a quick review. However, it is far too dull and sketchy for the general reader.

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Précis de Minéralogie. P. Lapadu-Hargues. Masson, Paris, 1954. 311 pp. Illus. + plates. Cloth, F. 2200; paper, F. 1700.

The purpose of this small book, as stated in the preface, is to interest students and scientists concentrating in other fields in the general aspects of descriptive mineralogy. The first section is very brief in its description of the concept of a mineral and the methods that are used to characterize them. The major portion of the book is devoted to the descriptive mineralogy, which classifies approximately 350 species.

While the pattern of other older familiar works on descriptive mineralogy predominates, the author has strived to introduce into the descriptive section mate-

rial concerning mineral structures and relationships which have been discovered by modern physical and chemical methods in recent years. He pays special homage in an eloquent epilog to the contributions made by x-ray diffraction and crystal structure analysis. On the whole, the work still retains the classical lines of descriptive mineralogy of 30 years or more ago, with the new material inserted as glosses on this basic pattern. There is such an enormous wealth of knowledge about the structure and physical and chemical behavior of minerals available today—which goes far toward explaining the most baffling problems of mineralogic paragenesis and phase relationships as well as explaining the specific behavior of the minerals themselves—that it is a disappointment not to see much more incorporated in this book.

There are many defects and errors that mar the text. The structural information is not of recent date: for example, the mixed SiO_4 and Si_2O_7 groups in idocrase are not mentioned, while a ninefold ring structure (Si_9O_{27}) is suggested for tourmaline. Many very rare species are described and classified, but several common species are not mentioned at all, such as epsomite, colemanite, apophyllite, prehnite, turquoise, and ice. There is no discussion of crystal symmetry; the long obsolete Levy symbols are used throughout; and the crystal figures are very poorly drawn. There is not a single reference to another book or paper.

It is to be hoped that the commendable plan of a work on mineralogy designed for the interest of scientists in general will be better fulfilled in future editions or issues.

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Guide for Safety in the Chemical Laboratory. General Safety Committee of the Manufacturing Chemists' Association. Van Nostrand, New York, 1954. xiii + 234 pp. Illus. \$4.25.

The publication of this book should satisfy the needs of laboratory staff members, instructors, and laboratory designers for a safety manual directed specifically toward problems that arise in chemical research and development.

Some sections of the book—the chapters that treat chemical hazards, toxicity, pressure vessel hazards, and personal protective equipment—are useful and even interesting reading for the experimenter. A pedagogical tone, perhaps impossible to avoid, is evident in other serviceable chapters that deal with everyday operations—for example, the danger of leaning too far backward (in swivel chairs) is pointed out. The discussion of hazards encountered in experimentation with radioactive substances should serve as an introduction to the subject for one who is considering doing such work. The chapter on specialized phases of first-aid and treatment was prepared by a medical committee and should be of interest to physicians as well as to laboratory workers.

References are given in the text and in a table.

Other tables on toxicity and flammability and a complete index are included. The usefulness of this book would be increased if supplementary bibliographic material were added, especially for the sections that are of an introductory character.

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An Introduction to Climate. Glenn T. Trewartha. McGraw-Hill, New York-London, ed. 3, 1954. vii + 402 pp. Illus. + maps. \$7.

In 1936 Finch and Trewartha published a textbook of nearly 800 pages entitled *Elements of Geography*. It was a very useful book because it was a survey of the whole field of geography, although the emphasis was uneven. The first and major part of the book dealt with the natural elements of landscape; the first several chapters were grouped into two sections under the titles "Elements of weather and climate" and "The climatic types and their distribution." The next year Trewartha revised and expanded these two sections somewhat and published them in a separate book entitled *An Introduction to Weather and Climate*. Trewartha explained that it was avowedly introductory in character; he treated the subject from the climatic rather than the meteorologic point of view and laid no claim to completeness. It was written as a textbook at college level for use in geography departments. It was a popular book and, after 6 years, was revised and reprinted.

Now, after 11 years, another edition has appeared, with the shortened title *An Introduction to Climate*. The organization is the same as that in earlier editions, but the fact is unmistakable that a great deal of work has gone into the revision. Large sections were rewritten in order to bring the discussion into harmony with more recent materials and points of view. There is an entirely new chapter on climatic classification. Many new illustrations have been added, and many of the old ones were revised or redrawn. Like the earlier editions, this book consists of two parts: Part I emphasizes the systematic aspects of climatology and part II the regional features as revealed in the world pattern of distribution.

The book was written by a geographer for geographers. The author emphasizes description and distribution but attempts to introduce sufficient background on the physical processes of the atmosphere to make the patterns of climatic distribution intelligible. It is his conviction that a climatology that omits, or seriously slights, genesis and explanation is not only dull but also inadequate for geographers' needs. Actually, to present the substance of physical climatology adequately to students who have had neither physics nor mathematics is impossible. Therefore, the explanation is necessarily largely geographic and descriptive rather than physical, and as such is mere garnish.

There is no real reason why we should have one climatology for geographers and another for meteor-