genera and species are comprehensive and excellent. They are supplemented with hundreds of line drawings, most of them superb. Polunin will, inevitably, be criticized for the way he has treated a few of the species, but he has been wise in remaining fundamentally conservative in his treatment of most of them. The frequent appearance of the abbreviations "agg." and "s.l." after specific names leaves both the author and the user of the book maximum latitude for interpretation.

One could wish that more references to the literature on difficult polymorphic species had been added to this volume instead of being reserved for another. Nevertheless, the book will be essential to anyone working with the arctic flora. For the first time in botanical history we have a work that constitutes a forthright attempt, by a qualified student, to describe all the basic species of vascular plants known to occur in the arctic.

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Fundamentals of Ornithology. Josselyn Van Tyne and Andrew J. Berger. Wiley, New York; Chapman and Hall, London, 1959. xi + 624 pp. Illus. $11.75.

This book, begun by the late Josselyn Van Tyne and completed by Andrew J. Berger, is intended as a textbook of ornithology at the college or university undergraduate level. It is a serious, scholarly work and a meticulously written book, above the average usually found in a textbook, and shoud serve its purpose very well indeed. Because of their accuracy and maturely reasoned presentation, the various chapters form digests and summaries of the special topics they treat that should be useful, as convenient references, to more advanced readers as well. The detailed descriptions of all the 160 or so recognized bird families of the world are the best and most readily assimilable short summaries available, and, as such, it seems not at all unlikely that they may well become standard, easy references for professional workers in the field.

Anyone who has attempted to organize the data and then to write reasonably short, and yet selectively inclusive, accounts of fields that are very actively expanding and changing—fields that are suddenly becoming open to new modes of study and to new expository approaches, such as the analysis of behavior patterns and of the impact of new devices such as radar on the factors affecting and directing migratory movements of birds—will appreciate the difficulties encountered by the authors and will be impressed by the success of their efforts. A good textbook, as compared with a merely adequate one, must not only give the student, or the nonstudent reader, the basic information on the subject but must also present it in such a way as to stimulate his thinking about it and whet his appetite. To a degree quite unusual in college texts, this volume succeeds in doing this. In my considered opinion, the Van Tyne-Berger book should meet with wide acceptance and should have a decidedly useful and progressively beneficial and important influence in training potential students of avian biology. To the biologist working in fields or specialties other than ornithology, the book may be not only a handy compendium of existing information but also something of an eye-opener as to the amount of integrated knowledge that exists concerning the most completely surveyed of all comparable animal groups.

The book is not only well conceived and well written; it is also well illustrated with numerous pen-and-ink drawings, by George Miksch Sutton, of a great variety of types of birds. These illustrations are uniformly excellent and add much to the appearance of the volume, illustrating and decorating it at the same time.

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Mineralogy. An introduction to the study of minerals and crystals. Edward H. Kraus, Walter F. Hunt, Lewis S. Ramsdell. McGraw-Hill, New York, ed. 5, 1959. ix + 686 pp. Illus. $9.

The main features that have characterized earlier editions of this popular text, of which the first appeared in 1920, are retained in this new edition. The numerous figures are mainly halftone reproductions of photographs. They include many portraits of well-known mineralogists and crystallographers and photographs of wooden models of crystals, which the authors seem to prefer to the more widely used line drawings. In the chapters on morphological crystallography (chapters 2 to 9, 88 pages) the Weiss parameters are still given the same prominence as Miller indices, being listed in every table and in the legend of every figure in which symbols for crystal forms are given. Though there is a brief explanation of axial elements and of how they may be determined from measured interfacial angles, only a single example of axial elements appears in the chapters dealing with particular crystal systems, and none in the descriptive section.

Many minor changes and small rearrangements have been made throughout the text. Among the more important changes is the addition, in the descriptive section, of Hermann-Mauguin symbols to characterize crystal classes. The chapter on chemical mineralogy, retitled "Chemical mineralogy and crystal chemistry," has been expanded by the addition of three and a half pages on crystal chemistry. The material in chapter 14, now entitled "Formation and occurrence of rocks and minerals," has been rearranged and expanded to give more emphasis to what Landes has called "geological mineralogy." In the descriptive section there has been some rearrangement in the order of treatment of silicate minerals, presumably with a view to taking account of structural relationships, but the chondrodite group has been separated from the olivine group, with which it is most closely related structurally, and placed between topaz and datolite. The formulas for chrysotile, members of the epidote group, and a few other minerals have been changed to correspond with the results of recent work.

The concluding chapters, "Gemstones" and "Classification of minerals according to elements," represent the special interests of some of the members of the department of mineralogy at the University of Michigan. The title of the latter chapter is a bit misleading, for this chapter (of over 40 pages) deals at length with the uses of minerals and their products and is illustrated by photographs of power shovels, stock piles, open pits, ore carriers, and industrial plants.

The glossary and the tabular classification of the 32 crystal classes (unfortunately separated from the chapters on crystallography by nearly 400 pages) are unchanged, as are the tables for the determination of minerals, which occupy nearly 170 pages. Several new items have been added to the selected bibliography.

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