author espouses Zwicky's theory of a regular secondary structure in crystals; indeed this theory was most popular. But van Hook apparently missed the "Ideal-und Realkristall" Sonderheft of the *Zeitschrift für Kristallographie* in which crystallographers dug a grave for that theory. This very number was also the one in which Taylor's epoch-making paper on dislocations appeared.

The second chapter, "Basic principles," is concerned with physical chemistry and crystallography. The section on crystallography should have been omitted, for its emphasis shows no perspective and it contains errors. For example, Figs. 2 to 7 show five standard isometric crystal habits, probably copied from another source: one is upside down, and another is standing on its left side. Two adjacent tables show that there are seven crystal systems; the next figure shows that there are only six. There are two stereographic projections and eight lines of discussion; this is inadequate explanation for the novice.

In "Modern theories," chapter 3, the history of the theory of nucleation is outlined from the literature. This survey includes the prediction and discovery of growth about spiral dislocations, but, surprisingly, only a few pages are devoted to this modern and basic aspect of crystallization. No mention is made of the extreme growth of a crystal in the direction of a reentrant, caused by twinning.

Specific data on linear rates of crystallization are given in chapter 4.

Chapter 5 is concerned partly with growing crystals and partly with purification by crystallization. It contains remarks on surface-active agents, crystallization with ultrasonic irradiation, and the chemical engineering aspects of crystallizing such things as salts and sugar.

The practice of crystallizing many products of commercial importance is described in the final chapter. These include not only salts and sugar but quartz, rubies, emeralds, and diamonds. There are also three paragraphs on whiskers, which have figured so prominently in recent literature.

At the end of each chapter there are several pages of references, and in addition there is an appendix entitled "General references on crystallization." The book is the American Chemical Society's monograph No. 152.

In the 10 years that have elapsed since publication of Buckley's *Crystal Growth*, the discovery of growth about spiral dislocations has caused the science of crystal growth to turn in a new direction. It is disappointing that this book did not make more use of this new material and of its bearing on crystallization.

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Hungarian Contribution

Absorption Spectra in the Ultraviolet and Visible Region. vols. 1 and 2. L. Lang, Ed. Academic Press, New York, 1961. vol. 1, 414 pp.; vol. 2, 237 pp. $18 per volume.

These volumes consist of a presentation of 349 visible and ultraviolet spectra, preceded by a 56-page "theoretical introduction." The spectra reported are those of a wide variety of organic compounds plus those of a few transition metal complexes and other inorganic substances. While the results of some solid and vapor phase studies are included, most of the spectra were taken in solution. Except for a few of Polish origin in volume 2, all were contributed by Hungarian workers. The preface to the second volume states that volume 3 is in preparation and that an increasingly international character is anticipated in subsequent volumes of the series.

The spectra are very clearly reproduced in a uniform format in which the logarithm of the molar extinction coefficient is plotted versus the wavelength in millimicrons. A very desirable feature is the fact that, in addition to the spectra themselves, the data from which they are derived are also presented. Moreover, each spectrum is backed on the same sheet by its associated data, and the entire collection is presented in loose-leaf form for ease of handling and organization. Information is also provided on the instrument used, the cell dimensions involved, and the concentrations studied in each case. Each volume is indexed by compound name and formula.

The value of the collection would be much enhanced if the source and purity of the material studied were indicated for each spectrum. In the case of previously published spectra, the appropriate literature reference should be cited. The fact that bibliographies are provided for some of the contributors does not obviate this criticism, since there is no specific cross reference between items in the bibliographies and the spectra presented.

The theoretical discussion that introduces volume 1 is the weakest part of this work. The sketchy outline of such topics as quantum machines and group theory presented there will be of little help to those without previous experience in these fields and is not needed by those with such experience. The many grammatical errors, awkward constructions, and misprints (in both text and mathematical expressions) found in this section detract greatly from its readability. Although the qualitative aspects of the discussion of the spectral features associated with specific chromophores are probably the best part of this introduction, the reader must be very cautious in accepting the detailed theoretical assertions included.

This compilation provides information which complements that found in such standard works as the American Petroleum Institute's catalog and Friedel and Orchin's *Ultraviolet Spectra of Aromatic Compounds* (Wiley, New York, 1951). It should be, in spite of the weaknesses cited, a useful addition to the libraries of academic and industrial research organizations.

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Multilingual

Astronomical Dictionary. In six languages: English, Russian, German, French, Italian, and Czech. Josip Kleczek. Academic Press, New York, 1962. 972 pp. $25.

About ten thousand technical words and phrases used in astronomy or in closely related fields are listed in this volume. It does not replace conventional bilingual dictionaries; instead it supplements them with technical words usually omitted and technical meanings or usages of common words. The dictionary is divided into two approximately equal sections. In the first are the technical terms, divided into 34 successive categories of subject matter —for example, astronomical optics and solar activity. For each term equivalents in the various languages are spread across two facing pages, with each of the six languages in a separate column. The second half contains a separate in-

dex for each of the six languages; each term in the index is followed by a reference to a section and an item number in the first part. These indexes are supposed to enable the user to look up unknown terms. It is therefore unfortunate that there are no cross references within each index. The user soon realizes that nearly all phrases are indexed under the grammatically most important noun, but it is unreasonable to expect him to look for least squares under "*method* of least squares." There are also some inconsistencies in the indexing: for instance, "expanding shell" appears only under "shell," while "spherical shell" appears only under "spherical."

Nevertheless, the book is generally useful, and it will be a valuable addition to library shelves. Few individuals will wish to pay such a formidable price, however.

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Historical Account

Astronomical Photography. Gerard de Vaucouleurs. Translated by R. Wright. Macmillan, New York, 1961. 94 pp. Illus. + plates. $6.

The subtitle of this small volume, "From the daguerreotype to the electron camera," correctly indicates that it is a history of astronomical photography rather than a how-to-do-it book. In telling who first photographed a particular object—say, the moon—the author also tells what kind of instrument, refractor or reflector, was used, its aperture and focal length, the exposure time, and the size of the image. Since the book is provided with a good index, it will undoubtedly serve as an excellent reference volume.

The reader would not guess that the book had been translated, if the title page did not indicate that R. Wright was responsible for the translation. There is no indication that it was originally published in French.

A good account is given of the gradual improvement of photography as an astronomical tool. The factor of increase in sensitivity of the photographic process, which occurred between 1857 and 1957, is estimated as 100 million. The author also uses a factor, not specifically defined, to measure the inferiority of photographic as compared to visual observations. He indicates that this factor has decreased from 10 in 1889 to 1.5 in 1943. In view of this interest in the comparative effectiveness of the human eye and the photographic plate, it is a little surprising that no comment is made concerning the gegenschein or the zodiacal light, save as an obstacle to recording faint stars.

Only a single page is devoted to color photography, and about ten interesting pages are concerned with electronic devices that are intended to increase the effective sensitivity of the photographic process. The illustrations are well chosen and well reproduced; they present astronomically important photographs taken between 1845 and 1959.

This book may be recommended highly to persons who are already well informed in physics or photography, but it is probably too technical for the general public. For example, the phrase, "failure of the reciprocity law," is used on pages 43 and 69, but it is explained briefly for the first time on page 81. Also, phrases such as "radiation of relativistic electrons in a magnetic field" (page 77) are used from time to time.

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English-German-French

Chemical Dictionary. J. Fouchier and F. Billet. Netherlands University Press, Amsterdam, ed. 2, 1961. 429 pp. $25.

The book is made up of three approximately equal parts, each of which provides a listing of about 12,000 technical terms from chemistry and physics with their equivalents in two other languages. Each page consists of three columns of words. The left-hand column contains single words or terms arranged alphabetically in one of the languages, English, German, or French; the other columns give the equivalents in the other languages. The three sections are English-French-German, French-German-English, and German-English-French. Clearly, the work is not simply a "chemical dictionary," as its title implies. It might be more aptly described as a "Dictionary of Chemical Terms with English, German, and French Equivalents."

The usefulness of any dictionary depends on both the number and the selection of words. The number of words or terms covered in this work is, by its triplicate nature, only one-third of what might be expected from simple consideration of the total number of pages: the coverage is limited indeed. A popular German-English dictionary for chemists contains 42,000 entries, compared with about 12,000 here. A more serious limitation appears in the selection of words. Although the authors claim to have included many new terms in this edition, I was struck by the following samples of its shortcomings: none of the words pteridine, lysergic acid, testosterone, estrone, pantothenic acid, or vitamin A were in the English listing; although the structural formulas for a large number of organic dyes and simple aromatic compounds are included, only molecular formulas are provided for such important compounds as cholesterol, ergesterol, and carotene.

On the positive side, the type and the arrangement of material on the page make for easy reading. The preface contains (in three languages) abbreviations, temperature conversion tables, a periodic chart, and a table of weights and measures. Finally, and this is one of the rather charming features of the dictionary, the authors have not limited themselves to a single translation; it is fun to see the shades of meaning that cluster about a single word in any one of the languages.

The price is high for such a limited dictionary, but this one will probably find its place on the desks of those concerned with translating technical articles written at a fairly unsophisticated level.

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Earth's Landforms

L'Evolution de la Lithosphère. vol. 3, *Glyptogénèse*. Henri Termier and Geneviève Termier. Masson, Paris, 1961. 471 pp. Illus. Paper, NF. 110; cloth, NF. 122.

Probably only geologists who have read Grabau's *Principles of Stratigraphy* will recognize the scope of this book from its title. As implied by its subtitle, the book deals with the sculpturing of the lithosphere and the resultant landforms. In a sense this is a regional geomorphology on a world scale, except that the approach is not one of systematic regional description but rather