view of physics might be more appropriately described as a mere glimpse.

Francis Bitter has attempted, with rather striking success, to treat in this textbook the gross macroscopic or integrated phenomena side by side with the examination of the microscopic processes vitally involved. The scope of the subject matter covered is broad, extending from electricity and magnetism and optics through modern and nuclear physics. For institutions offering an intensive course in physics and the calculus during the freshman year, the level of the present textbook might be placed at the sophomore, or possibly the junior, year.

The comprehensive view presented the student is perhaps best illustrated by citing the topic headings in the chapter on "The electrical properties of matter": (i) electrons and protons; (ii) Rutherford and the nuclear atom; (iii) excitation and ionization; conduction in gases and solutions; (iv) metals and semiconductors; resistivity; (v) polarization; (vi) displacement currents and displacement; (vii) the energy in polarized dielectrics; (viii) electrical measurements; (ix) Kirchhoff's rules; (x) time constants; (xi) impedance—electronics.

The textbook is also provided with an ample number of problems, running through a complete range of complexity. The aforementioned chapter, for example, has 44 problems of which at least ten may be categorized as searching.

A sophomore-year course based on this textbook could be used to lead to the more specialized subjects, with a treatment substantially more advanced than is current practice. This would be particularly true if this year were also spent in increased mathematical preparation.

WILLIAM HORNYAK
University of Maryland

A Handbook of Hardwoods. Compiled by the Forest Products Research Laboratory, Department of Scientific and Industrial Research. H. M. Stationery Office, London, 1956 (order from British Information Services, 20 Rockefeller Plaza, New York 20). 269 pp. $3.15.

This handbook brings together the sections on hardwood in two of the laboratory's earlier handbooks, *Homegrown Timbers* (1945) and *Empire Timbers* (1941). The present volume has been considerably expanded to include more species and additional data as well as a tabular guide, for quick reference, to the properties of the more commonly used timbers.

Traité de Pharmacie Chimique. vol. I, **Chimie Minérale.** vol. II, **Chimie Organique.** Série acyclique. Composés non azotés. Série cyclique. Composés non azotés. vol. III, **Chimie Organique.** Série cylique. Composés organiques azotés. Série hydroaromatique. Série terpenique, Stérols et acides biliaires. Vitamines. Hormones. Composés organo-minéraux. vol. IV, **Chimie Organique.** Composés hétérocycliques. Matières colorantes artificielles. Antihistaminiques. Alcaloïdes. vol. V, **Chimie Organique.** Hétérosides. Protides. Produits divers. Antibiotiques. P. Le Beau et M.-M. Janot, Ed. Masson, Paris; Stechert-Hafner, New York, ed. 4, 1955–56. 4978 pp. Cloth, F. 37,000 for 5 vols.; paper, F. 32,000 for 5 vols.

This is a reference work of the first magnitude. From its attractive black, red, and gold covers to its comprehensive indexes, it is a work that is masterfully conceived and skillfully executed. Its two principal authors and their six collaborators, all of whom, with one exception, are members of the Faculté de Pharmacie de Paris, are to be congratulated in bringing out this new edition.

The previous edition, the third, which appeared in 1947, numbered some 4450 pages divided among four volumes; this present opus has an additional 500 pages requiring the introduction of another volume, the fifth. The printing is well done and the choice of type face makes it easy to read. (Those for whom French is not their native tongue should not find it difficult reading because the style is simple and straightforward.)

Of the five volumes only the first is devoted to inorganic substances of medicinal and pharmaceutical interest, the remaining four being concerned with organic compounds. Because of this division the authors have furnished two indexes, one at the end of volume I for the inorganic elements and compounds, and the other at the end of volume V to cover all the material of volumes II to V. These indexes are rather complete, the first numbering 27 pages and listing about 4500 entries for 800 pages of text; the second index includes 157 pages and lists about 22,500 entries for almost 4000 pages of material. In cases where a compound or preparation has several synonyms or trade names, cross references are given, thus making the indexes eminently useful.

The references, indicated by small superscripts in the text, are found at the bottom of the appropriate pages. Although the selection of references makes no attempt at being complete, it seems, for the most part, to be adequate, inasmuch as both the old and newer literature is cited. Since a work of such magnitude could not be readily completed except over a period of time, the authors have provided some 55 pages of addenda, at the end of the first and fifth volumes, containing references to recent publications—for example, the 15th revision of the *United States Pharmacopeia*.

Because the present state of our knowledge does not permit an adequate classification of chemical substances according to their physiological or pharmacological properties, it is necessary to employ a scheme which, in great measure, is based on chemical principles. Thus, this involves, for the inorganic substances, the use of the periodic table, while the division of organic preparations and compounds generally follows functional groupings. A slight departure from this order is made when separate chapters in the volumes dealing with organic compounds are given over to the consideration of antibiotics, antihistamines, toxins, venoms, hormones, and vitamins. A valuable addition to the first volume is a chapter that discusses the natural and artificial radioactive substances.

In the volume dealing with the elements and their inorganic compounds, the basic order of treatment is uncomplicated. Each chapter covers one element and its compounds with a brief introduction, which includes a history of our knowledge of the element, some technologic data such as production figures, natural distribution, methods of commercial preparations, and some economic statistics. For each compound there is given the chemical formula, the percentage by weight of the elements comprising it, synonyms and trade names, methods of preparation, chemical and physical properties, assay, use, physiological and pharmacological properties, and remarks. This pattern is followed, with some variations as needed, throughout the entire set.

The order of the four volumes dealing with the organic compounds is somewhat more involved. Of the several possible methods of organizing the extensive material, the authors chose to follow one based on functional groupings. Volume II deals with the nonnitrogenous cyclic and acyclic compounds. Volume III includes cyclic nitrogenous compounds, aromatic hydrocarbons, terpenes, sterols, vitamins, hormones, and metal-organic compounds. The following volume (IV) covers the heterocyclic compounds, synthetic dyes, antihistamines, and alkaloids. The last volume (V) deals with the heterosides, protides and derivatives, and antibiotics.

In so extensive a coverage one could find items to which exception might be

taken. One may wonder, for example, why no mention is made of the use of sodium fluoride as a dental prophylactic, although a few comments are made on its toxic action on teeth. Or, again, the melting point of chlorpromazine hydrochloride is given as 180°C notwithstanding that the value more generally cited is closer to 195°C (as it is in the supplement to the 15th revision of the *U.S.P.*). Many, if not most, of the typographic errors were picked up by the authors and are listed in the several pages of errata. Despite these slight imperfections, the over-all work is not marred; it remains an excellent contribution to the field of pharmaceutical chemistry.

ALBERT MORACZEWSKI
University of Chicago

Procedure in Taxonomy. Including a reprint in translation of the Regles Internationales de la Nomenclature Zoologique. With titles and notes on the opinions rendered to the present date (1907 to 1956). Completely indexed. Edward T. Schenk and John H. McMasters. A. Myra Keen and Siemon W. Muller, Eds. Stanford University Press, Stanford, Calif., ed. 3, 1956. vii + 119 pp. $3.50.

Almost a third of this book is devoted to succinct recommendations and clarifications of procedure in taxonomic practice, particularly in the nomenclature of systematic categories, in the designation of type specimens, in the storage of type material, in the naming of genera and species, in the treatment of synonymy, and in the descriptions of new species. The chapters are brief summaries and are far from being exhaustive treatments of the more difficult problems. A short history of the International Commission on Zoological Nomenclature is added. The rest of the book contains a reprint of the latest revision of the International Code of Zoological Nomenclature, together with summaries and titles of opinions rendered through 19 June 1956, titles to declarations of the international commission made through 19 June 1956, and directions issued by the international commission from 1954 to 17 May 1956. A good subject index to cited names and topics is appended.

The book is a handy manual for the practicing taxonomist and should facilitate clear and concise taxonomic publication. Little excuse remains for the errors and ambiguities of the past, particularly the confusions of the 19th-century literature before the codification of the rules of nomenclature.

Genetic homology through evolutionary change provides a testable principle underlying systematic order. Nomenclature is mainly a tool for bibliographic continuity for comparative biological knowledge. General international agreement on the names of animals, together with a fluid order of symbolic expressions as knowledge increases and past errors are detected, renders taxonomic nomenclature superior to the nomenclatural systems used in any other branch of biology. When the strict application of the rules results in greater confusion, the rules may be suspended after a careful review of each case.

Protests by individuals or groups concerning special aspects of the rules as applied to particular cases are welcomed and judged on their merits by the international commission. Decisions are sometimes reversed when new information is obtained. Final stabilization of animal names with rapid advance in knowledge and scholarship is not possible in the foreseeable future, but uniform procedure in establishing and changing names is greatly enhanced through the work of the international commission and the international congresses. Relative stabilization is attained through common agreement with freedom of expression and action leading to reform and progress. Individuals and groups sometimes differ from the recommendations of the international code and often publish names at variance with the rules. In the long run, the gradually improving code usually prevails.

The problem of handling the names of millions of organisms studied by hundreds of thousands of individuals over the years in many parts of the world is almost overwhelming. Great praise should be given to the taxonomists and their organizations for a system that demonstrably operates so effectively. Systematics is rapidly taking its rightful place as a major subscience which interacts with all the other biological sciences. Nomenclature is a system of symbols that facilitates the comparative study and advance of biology.

ALFRED E. EMERSON
University of Chicago

Valency and Molecular Structure. E. Cartmell and G. W. A. Fowles. Academic Press, New York; Butterworths, London, 1956. 256 pp. Illus. $5.80.

In this small book the authors give a brief introductory discussion of quantum theory and atomic structure, and a rather detailed, though succinct, treatment of the quantum theory of valence and of molecular structure. The topics covered are black-body radiation and other phenomena lying at the basis of quantum theory, the Bohr theory, the spinning electron, the wave equation, the wave functions for hydrogenlike orbitals, the relation of the periodic table to the electronic structure of atoms, the valence-bond method of approximate quantum mechanical discussion of molecules, the molecular orbital method, directed valence bonds and hybrid orbitals, bond energies, the sizes of ions, the hydrogen bond, the metallic bond, van der Waals interaction, the structures of simple inorganic compounds, the structures of complexes, and the structures of electron-deficient molecules.

Most of the treatment of these topics is conventional. The authors write in a clear and lucid style. Occasionally the discussion of a theoretical point is so brief as to give rise to the danger of misunderstanding by the student reader, for whom the book is designed. References are given at the end of each chapter. Usually these references are not to original papers but to review articles.

This book should be useful in serving the purpose for which it was written, that of helping to bring new life into the teaching of inorganic chemistry.

LINUS PAULING
California Institute of Technology

Treatise on Invertebrate Paleontology. Part F, **Coelenterata.** Raymond C. Moore, Ed. Geological Society of America and University of Kansas Press, New York, 1956. 498 pp. Illus. $7.

This welcome addition to the invaluable *Treatise on Invertebrate Paleontology* obviously owes much to the indefatigable labors on the part of the editor who has succeeded splendidly in collating and systematizing the parts written by a number of collaborators. As in the preceding volumes of the series, the accounts are not limited to extinct forms but take into consideration all members of the phylum, placing them systematically in an arrangement that, if not finally acceptable, at least facilitates the study of the phylum. I consider unfortunate the retention of ctenophores in the phylum, although it now appears that there is at least one ctenophore with intrinsic nematocysts.

In the introduction by Hill and Wells the statement that Cnidaria have fundamentally biradial structure is incomprehensible and seems to indicate a lack of understanding of the term *biradial*. Actually the Cnidaria have fundamentally tetramerous radial symmetry, unless one adheres to the theory that the phylum was originally bilateral. It is interesting to note that the oldest cnidarian fossils