plant resources, involving information on agriculture, forestry, plant diseases, plant distribution, ecology, climatology, geology, economic plants, soils, mycology, conservation, ethnobotany and paleobotany. Most, if not all, of these men either live there, or have lived there.

Special features are very artistic plates, in many cases reproduced from classical publications on botany.

Pennell writes an interesting historical sketch in which one becomes quite well acquainted with botanical exploration and investigation up to 1850. Fosberg treats of the economic plants with references and native names, classified as to general use, such as fibers, insecticides, etc. Smith and Johnston in their phytogeographic sketch do an admirable job of telling you how the land lies in regard to the vegetation types. Popenoe presents an all-over picture of the problems of tropical agriculture, including those of agricultural education.

There are selected lists of travel books of botanical interest; an extremely interesting selected reference list, technical as well as general, involving guides, books by Carleton Beals, science congress proceedings, Adamic's description of Popenoe's house in Antigua and a mine of other intriguing items.

Several chapters are devoted to such subjects as "Agricultural Scholarships and Interamerican Relations," "Some of the Principal Latin-American Plant Science Periodicals," "Cooperative Agricultural Research and Extension Stations in Latin America," "On the Location of Botanical Collections from Central and South America," "The Advantage of the Tropical Environment for Studies on the Species Problem" and "Plant Breeding, Genetics and Cytology in Latin America."

Every country from Mexico to Argentina is covered, and most of the West Indian Islands are included. There are also treatments of the Falklands, Galapagos and Juan Fernandez. Most of the articles are in English, but a number are written in Spanish, French and Portuguese.

The most thought-provoking article in the book is the introductory essay by the editor entitled "The Plant Scientist in the World's Turmoils"—an essay, including the footnotes, which most scientists would do well to read carefully and meditatively.

One of the special features is subject to criticism, even though the editor in a footnote takes the blame. I refer to Dr. Lanjouw's "The Location of Central and South American Botanical Collections." The explanation of the symbols used to designate the herbaria does not occur in this volume, which is unfortunate, but which can be partly rectified by publishing such a list in pamphlet form at a nominal cost.

A detailed table of contents takes the place of a subject index. There are indices of personal names, plates and text illustrations.

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ORGANIC CHEMISTRY

The Characterization of Organic Compounds. By SAMUEL M. MCELVAIN, professor of chemistry, University of Wisconsin. ix + 282 pp. $8\frac{1}{2} \times 5\frac{3}{4}$ in. New York: The Macmillan Company. 1945. $3.40.

THE first important publication in this field was Mulliken's "Identification of Pure Organic Compounds," the initial volume of which appeared in 1905, and the fourth in 1922. This work was received so favorably that the issue of certain of the volumes was quickly exhausted and they have since been practically unobtainable. The first edition of Kamm's "Qualitative Organic Analysis" was published in 1922; and Staudinger's "Anleitung zur organischen qualitativen Analyse" in 1923. Shriner and Fuson's "Systematic Identification of Organic Compounds; a Laboratory Manual" came on the market in 1935, and in 1941 there appeared the "Identification of Pure Organic Compounds. Tables of Data on Selected Compounds of Order I," by Huntress and Mulliken, which, in general purpose, plan and function, as well as in the basis of its primary classification, resembled its predecessor of similar title. In other respects, however, the two are quite different, so that this new compilation should not at all be regarded as a new or revised edition of the earlier "Mulliken," but as an original contribution. The author of the book under review has adopted in the main the analytical treatment first advocated by Kamm, rather than that of the Mulliken volumes.

Based upon the experience of twenty-two years' teaching at the University of Wisconsin, with senior undergraduate and first-year graduate students from a great variety of American colleges and universities, its general purpose is to develop a systematic and comprehensive procedure for the identification of organic compounds and, in so doing, to bring home to the student the practical applications of the fundamental principles of the science and the distinguishing characteristics of the various classes of organic compounds upon which is based the really wonderful systematic classification of the whole limitless domain of organic chemistry.

It also provides an unrivaled opportunity for stimulating his interest in the subject and for passing on to him some of that inspiration and enthusiasm without which the teacher becomes merely a *vox et praeterea nihil.*

The procedure, which is developed in detail, con-

sists of four main steps: (1) The determination of the physical properties and the establishment of the purity of the compound; (2) determination of the class (aldehydes, amines, acids, etc.) to which the compound belongs (by qualitative analysis, solubilities and class reactions); (3) location of the compound within a class or possibly homologous series of compounds; and (4) preparation of derivatives.

Most, if not all, of our leading universities now offer such training as a third semester course and, in the opinion of the reviewer, it should always be required for admission to original research in organic chemistry.

The text is lucid and concise, with numerous detailed experiments, illustrations, graphs, structural formulas and tables. The book is bound in dark green cloth, with gold lettering, and a red phenanthrene nucleus as a lead for the title. Type and presswork are excellent. It should be very helpful and is heartily recommended.

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PLASTICS

The New Plastics. By HERBERT R. SIMONDS, M. H. BIGELOW and JOSEPH V. SHERMAN. xii + 320 pp. New York: D. Van Nostrand Company, Inc. 1945. $4.50.

THE plastics industry has come a long way in the past five years—so far, in fact, that the authors of the book in question considered it fitting to prepare a semi-technical volume devoted almost exclusively to plastic materials, processes and uses which have been developed since 1940.

There is little question of the timeliness of their effort. It is of the utmost importance to the plastics industry that its new materials, their war uses fulfilled, should not be allowed to fall into disuse and that new mass-production techniques should not give way to costlier methods for want of quantity demand.

Almost all the regular books on plastics are forced, of necessity, to deal with such a variety of topics that only the mass-produced, established plastics and their processing methods can be discussed in any detail. Since most references to these books are made for the purpose of finding data on specific materials for more or less standard types of application, this is usually fairly satisfactory, but the lack of detailed data on new developments may lead to their being overlooked, even where they could give superior service. Of more significance, however, is the fact that lack of recent information may cause the producer of a new product to turn away from plastics because he can not find, among the standard materials, one which could suit his purpose.

The present book is by no means an encyclopedia of all that has been accomplished since 1940, but it is an excellent attempt to condense the more important information into one volume. After a brief review of the industry prior to 1940, the authors discuss, in turn, the most recent developments (plastics such as polyethylene, nylon and the silicones); certain established new materials, such as the melamine, allyl and vinyl resins; and improvements in such substances as vinyl elastic molding materials and polystyrene.

The new synthetic fibers, closely related to plastics, are then considered, with considerable emphasis on nylon, Aralac and Vinyon. Other chapters deal with such new and important adhesives as Reanite and Cycleweld cements; various new laminating materials such as glass-cloth laminates; such new applications of wood and paper as Impreg, Compreg and methylolurea-treated wood; and the various synthetic rubbers, which are not discussed in any detail.

Much has been heard in recent years about molding with electronic heating, and this and other new processes are discussed, with the inclusion of significant economic data. New forms and coatings are considered in the last technical chapter, and the book is concluded with an all-too-brief chapter on plastic trends.

To quote the jacket, "this book furnishes the most complete information on the important advances made during the last five years by the entire plastics industry," although it may not quite constitute a "comprehensive manual of practical information on *all* the new developments in plastics." The present reviewer has followed these developments with interest during the period covered by the book, however, and feels that this compact volume is a worth-while addition to the bookshelf of every individual who has anything to do with plastics, unless that person has available a complete and indexed file of the recent literature. The style of writing is factual and clear, yet not too technical for the interested layman to appreciate, at least in part.

B. H. WEIL
GULF RESEARCH & DEVELOPMENT COMPANY,
PITTSBURGH, PA.

BOOKS RECEIVED

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STEARN, E. WAGNER and ALLEN E. STEARN. *The Effect of Smallpox on the Destiny of the Amerindian.* Pp. 7 + 153. Bruce Humphries, Inc. $2.50. 1945.

LIDDELL, DONALD M., Editor-in-chief. *Handbook of Nonferrous Metallurgy.* Second edition. Illustrated. Pp. xi + 721. McGraw-Hill Book Company. $7.00. 1945.