

cists and to chemists interested in assaying. It is an outgrowth of the Pharmacopeia and the reviewer regrets that space does not permit him to dwell at greater length on its excellent features. Every volumetric method of the Pharmacopeia is recorded explicitly with the one exception for oleic acid in which the process of Muter's Chemistry is substituted, being an improvement, however, in that the assay introduced determines oleic acid in the presence of stearic and palmitic acids which the method of the U. S. P. does not accomplish.

Notwithstanding that such a variety of subjects are embraced and condensed in a comparatively small volume, superficiality can not be charged against it. The book enables the reader, even though he has but a limited training in chemistry, to comprehend and at once carry out each assay described. It should be in the hands of every pharmacist.

J. U. LLOYD.

A TEXT-BOOK OF INORGANIC CHEMISTRY. BY G. S. NEWTH, F.I.C., F.C.S. pp. xiii; 667. 146 Illustrations. London and New York: Longman's, Green & Co. 1894. Price, \$1.75.

To those who have learned to appreciate the value of Newth's "Chemical Lecture Experiments," the announcement of a complete text-book by the same author, will certainly be a matter of interest. Lecturers on experimental chemistry have found the "Experiments" a most helpful guide, replete with clever, ingenious, practical devices for the lecture table, placing at the instructor's service all the latest mechanical and electrical adjuncts, and substituting for many of the antiquated illustrative features, modern striking forms of experimentation.

The same characteristics are to be encountered in the new work, freshness in material and treatment, numerous illustrations, novel and suggestive, replacing many of the time-honored wood-cuts of the standard text-book.

The author's arrangement of matter is a deviation from all the customary methods. He divides his work into three quite distinct parts. Part I—"Introductory Outlines." 150 pages are devoted to theory and chemical physics, notation, nomenclature, atomic weights, valence, heat, pressure, electrolysis, solutions, thermo-chemistry, periodicity, etc. This whole section is

marked by great clearness of presentation and accuracy of statement.

Part II. "The Study of Four Typical Elements." 150 pages are devoted to quite an exhaustive treatment of hydrogen, oxygen, nitrogen, and carbon, with their more important compounds. This section unfrequently recalls Hofmann's famous "Einleitung" where likewise a few elements are utilized to bring out the main essentials of chemical fact and theory. Especially noteworthy in this part is the admirable treatment of *flame* and *combustion* thoroughly up to the times, and far in advance of any existing text-book treatment of these important topics.

Part III. 350 pages are devoted to the remainder of the elements, following closely the periodic classification. The space given each element is necessarily somewhat limited, sodium, for example, receiving but twelve pages, magnesium, four pages, etc. Here we notice, however, as a rule, that the work is well up to the times, notably in technical manufacturing processes. Geographical reference is almost entirely omitted, with some rare exceptions, as in the case of mercury.

Just what is the most advantageous arrangement of the matter in a text-book of this size, is a moot question. Among recent works we find on the one hand Mixer's, adhering rigidly to the periodic classification, and on the other hand Freer's, following the same classification after a study of oxygen, Remsen's doing likewise after a study of oxygen, hydrogen, and chlorine, while, as we have seen, Newth prefaces the same classification with a study of four elements, and prefaces the latter also with an extended section on theoretical and physical chemistry. From my own experience and observation I am inclined to the opinion that the brighter, more persevering students in a college class make satisfactory progress with any of these types, while, on the contrary, a considerable number can profitably take up such a text-book as Newth's only after preliminary drill in some one of the excellent elementary works introducing theoretical concepts gradually, with the acquisition of the necessary experimental facts.

While recognizing fully the many excellent qualities in Dr. Newth's work, attention should be called to several of those

deficiencies which are almost inevitable in an author's first edition. Thus while there is an excellent chapter on thermochemistry in the introduction the subject is almost entirely ignored in the treatment of individual elements and compounds, although in so many cases (as in that of the allotropic forms of phosphorus) it serves admirably to explain important facts.

Uniformity and simplicity in nomenclature are frequently neglected. Note, for example, the following two headings of sections within a few pages of each other: (1) *Arsenuretted Hydrogen* (*Arsenic Trihydride*, *Arsine*), and (2) *Antimony Hydride* (*Antimoniuretted Hydrogen*).

The space assigned individual metals seems frequently too brief; and despite the author's excuse in the preface, I can not approve of the very step-motherly treatment in a book of nearly 700 pages, of the so-called rare metals. Titanium, which is so important to the metallurgist and which forms a larger percentage of our planet than does carbon, receives four lines. Zirconium, cerium, and thorium are passed by with the same meager mention, although their oxides are now in every-day use in our homes for illuminating purposes. This latter fact is omitted entirely, while mention is made of the now much less extended employment of lime for similar purposes. Tungsten, molybdenum, and uranium receive together but one page.

While, as already stated, the work in most instances is quite up to the times—for example, in the account of the lately discovered new element in the atmosphere—still in certain cases there is an inexcusable lack of recognition of recent fact and method.

Thus, under aluminum, we find but a single method of preparing the metal. The historically interesting process of St. Clair Deville receives over a page of description. But not a gram of aluminum is made to-day by that method. That more and more valuable servant of the modern chemist, electrolysis, is granted in fact but scant attention. While a brief allusion to the action of the current on sodium chloride is found in the preface, no mention is made of the important reaction in connection with either chlorine or with sodium compounds. Similarly, while fourteen different methods for preparing oxygen are described in detail, not a word is given to the simplest and most

elegant of all, the reaction between water and sodium peroxide, now employed in every laboratory and lecture-room. No mention is to be found of red fuming nitric acid.

The date of 1876 for Moissan's discovery of free fluorine is probably a typographical error.

T. H. NORTON.

DIE MASCHINELLEN HILFSMITTEL DER CHEMISCHEN TECHNIK. VON Alwin Parnicke. pp. 320. 327 Illustrations. H. Bechhold, Frankfurt, A. M. 1894.

The lack of a good manual on the methods used for the mechanical preparation of substances used in the chemical industries to which Mr. Pemberton has already called attention in these columns, (see this JOURNAL, 1893, p. 634) is supplied in the excellent digest of the subject contained in this book. The sections into which the book is divided may be translated as follows: 1. Sources of Power. 2. Transmission of Power. 3. Methods of Transportation. 4. Grinding. 5. Mixing. 6. Melting, Dissolving, and Extraction. 7. Concentration. 8. Mechanical Separation. 9. Drying. 10. Weighing, Determination of Temperature, Pressure, and Draught. 11. Laws Relating to the Subject.

The book is well printed and the illustrations are excellent, an important matter in such a book. It is to be hoped the book may find a translator who will condense it sufficiently for class use.

E. H.

THE ELEMENTARY NATURE OF CHLORINE. BY HUMPHRY DAVY, SEC. R. S., 1809-1818. PAPERS PUBLISHED IN THE PHILOSOPHICAL TRANSACTIONS. ALEMBIC CLUB REPRINTS, NO. 9. 80 pp. Edinburgh: William F. Clay. 1894.

This reprint is no less interesting than its predecessors. The first three papers give the results of experiments made to determine the properties and composition of "muriatic acid." In the remaining six papers Davy describes a few experiments by other chemists and many of his own upon "oxymuriatic acid," discusses them and, without asserting that this gas is an element, suggests that it be called chlorine, on account of its color and because it "is not known to contain oxygen and can not contain muriatic acid." A short account of the discovery and properties of "Euchlorine" is found in one of the papers.

L. B. HALL.