In this well-written and well-printed volume, Dr. Youngken has included a vast amount of information upon one of the most important topics of applied microscopy. The great mass of crude drugs is drawn from the vegetable world, but the animal division yields a few. This material is subject to much adulteration, and also to many changes from conditions that are what may be called natural. Processes of decomposition of the type commonly called "spontaneous" go on frequently, and the attacks of insects are also productive of great injury. In the naming and describing of the drugs the author follows, of course, the United States Pharmacopœia and the National Formulary. An interesting summary is given of the history of pharmacognosy. The term was introduced by Seydler, in 1815, meaning simply the "knowledge of drugs," but, as noted, the fact that plants were in remote times collected for use as medicines shows that the earliest "herb doctors" had some system of recognition. The first written enumeration of such materials is that of Dioscorides, compiled about three quarters of a century before the present era. Centuries elapsed before further systematic work was published, it being stated that this was by an Arabian physician in the thirteenth century.

Turning to the matter of the book, after about 30 pages of preliminary information, the individual drugs are taken up and the characteristics of genuine samples are given. The adulterations are then detailed. The extensive use of excellent drawings and photographs adds much to the usefulness of the book. Most of these are presumably the work of the author, with some assistance of others and are very clear and distinct. In a few cases of sections of stems, the details are not minutely sharp, but always clear enough for recognition. In making photomicrographs of vegetable preparations, the use of a red screen will often be found advantageous. This lengthens the exposure considerably, but seems to give greater sharpness with ordinary light. It seems to the reviewer that the approximate degree of magnification should be entered with each figure.

Every page of the book gives evidence of thorough familiarity with the field, painstaking and persistent study of details, careful selection of data and vivid presentation of all the facts. The book will be of great service not only to the pharmacologist, but to the chemist engaged in analytical work in connection with supervision of food and drugs. It is one more gratifying evidence that American work is acquiring a dominance in scientific fields. A comprehensive table of contents and an excellent index are commendable features. The mechanical execution is of very high type. The text is clear and correct. The book is highly creditable to both author and publisher and will find a wide field of usefulness.

HENRY LEFFMANN.

WITHIN THE ATOM. A Popular View of Electrons and Quanta. By John Mills, Fellow, American Physical Society. 12mo, 215 pages, 36 illustrations in the text and 4 plates. No index. New York, D. Van Nostrand Company. Price, \$2.00 net.

The theories that matter is discrete and that the ultimate particles are extremely minute, indivisible and indestructible date, in outline, from about five hundred years before the beginning of the present era. Unfortunately,

only scanty fragments of the writings of the early Greek philosophers have come down to us, and some of this material is known through quotations by writers who were not wholly in sympathy with those they quoted. From the limited information we have of scientific thought in this early age, it seems that a materialistic and agnostic spirit was quite marked, and Cumont has shown in his essay on "Astrology and Religion" that the earliest Greek philosophers opposed the view that the stars had any influence on human beings, declaring that all the stars were merely balls of fire. Lucretius, in the first century of the common era, gives a very elaborate discussion of the nature of matter, and compares the elements and compounds, respectively, to the letters and words of a language. All this early philosophy must have been reached deductively, as we have no reason to believe that experimental science had any noticeable development.

The book before us is offered, we are told in the preface, for readers who have no previous knowledge of electricity, mechanics or chemistry. There is no question of the author's familiarity with the modern views, and of the earnest effort he has made to present the complicated phases of these views in an attractive form, understandable by the ordinary reader. How far he has succeeded in this effort is a serious question. It would appear from the fact that on the title page he lays no claim to a college degree or a teaching experience, that he has had but little association with the student body, and, therefore, probably still less with the "man in the street," to whom the book is specially intended to appeal. Far be it from our intention to claim that a college degree is necessary to constitute a successful author of a text-book, but abundant experience demonstrates that capacity for giving instruction is rarely inborn, and even when the person has naturally such talent, much experience is needed to develop its full efficiency. Even the greatest geniuses are better for some training.

The literary style is in many places brilliant, but again often turgid and too highly latinized for easy comprehension by the general reader. The essay begins by representing the atom as composed of two classes of particles, "electrons" and "protons." The latter word seems to be coined, although it is introduced somewhat vaguely. It is presumably the positive nucleus of other writers. Reference is made to the mutually repellent powers of electrons and protons, respectively, and to their mutually attractive powers for each other. The analogy of sex attraction, which though very often used in this department of science, is wholly irrelative, is suggested, but is rejected because it will involve "connotations of animistic bias." This sentence will remind one of the conversation concerning Buck Fanshaw's funeral. Later, however, we are told that the picture that we form is like a state of society in which "promiscuity prevails." So the "triangle" is now in chemistry!

The reviewer is compelled to express the view that the literary form in which the matter of this book is cast has seriously injured it. New terms are unnecessarily introduced. The terminology of science grows fast enough without forcing. Whoever introduces a new term without good reason, let him be anathema. The words "pellate" and "tractate" are used as substitutes for "repel" and "attract" to avoid the "animistic bias." They are

apparently not the author's coinage, but their use seems unnecessary. The absence of an index is to be condemned.

The mechanical execution of the book is good; numerous clear illustrations and several fine plates will aid materially in understanding the several chapters.

HENRY LEFFMANN.

PUBLICATIONS RECEIVED.

Die Technik der Elektrischen Messgeräte, von Dr. Ing. George Keinath. 448 pages, illustrations, 8vo. Munich and Berlin, R. Oldenbourg, 1921. Price, in paper, 112 marks.

Imperial Institute: Monographs on Mineral Resources with Special Reference to the British Empire; Silver Ores, by H. B. Cronshaw, B.A., Ph.D., A.R.S.M. 152 pages, illustrations, 8vo. London, John Murray, 1921. Price, in paper, 6 shillings, net.

The Transit: Published annually by the College of Applied Science, University of Iowa. Vol. 21, 70 pages, illustrations, 8vo. Iowa University, Iowa City, 1921.

The Photo Miniature, No. 183, Color Photography, an authoritative summary of the progress made toward the final solution of the problem, with a clear explanation of the principle underlying the methods of to-day and to-morrow. 144 pages, illustrations, 12mo. New York, Tennant and Ward, 1921. Price forty cents. (Contains a very well written and plain statement, by Dr. C. E. K. Mees, of the principles and present practice in color photography, giving several of the most recent suggestions for color cinematography.)

U. S. Bureau of Mines: Bulletin 186, Investigations of Zirconium, with especial reference to the metal and oxide. Historical Review and Bibliography, by J. W. Marden and M. N. Rich. 152 pages, illustrations, 8vo. Monthly Statement of Coal-mine Fatalities in the United States, June, 1921, by W. W. Adams. 22 pages, 8vo. Technical Paper 261. Oil-camp Sanitation, by C. P. Bowie. 32 pages, illustrations, 8vo. Washington, Government Printing Office, 1921.

Technical Books of 1920. A selection. 28 pages, 16mo. Brooklyn, New York, Pratt Institute Free Library, 1921.

National Advisory Committee for Aeronautics: Sixth Annual Report, 1920, including Technical Reports Nos. 83 to 110. 717 pages, illustrations, plates, diagrams, quarto. Technical Notes, No. 31. Crippling Strength of Axially Loaded Rods, by Fr. Natalis. 34 pages, plates, quarto. Technical Notes, No. 61, Performance of a Vane Driven-gear Pump, by R. H. Heald. 10 pages, diagrams, quarto. Technical Notes, No. 64, N. A. C. A. Recording Air-speed Meter, by F. H. Norton. 5 pages, plates and diagrams, quarto. Technical Notes, No. 70, The Effect of Staggering a Biplane, by F. H. Norton. 3 pages, diagrams, quarto. Washington, Committee, 1921.