

of gases, the nature of the electrons constituting the cathode rays, and the evidence of the electrical nature of matter. In the fifth chapter, X-rays and Becquerel or β -rays, and the identity of the latter with cathode rays are discussed. The next six chapters treat of the discovery of radium and of the phenomena of radioactivity. These are followed by three chapters on radioactive emanations and induced radioactivity. The concluding four chapters deal chiefly with the spontaneous transformation of matter and the explanation of the phenomena of radioactivity by means of the disintegration hypothesis and the electron hypothesis regarding the nature of the atom.

There are numerous references to the original literature, but no attempt has been made at completeness in this direction. There is a good index. A few misleading or erroneous statements exist. On p. 141 it is stated that after the separation of UX, the remaining uranium was not appreciably radioactive. This is of course true if the activity is measured photographically, but electrical measurements show that the ionizing power of uranium is but slightly altered by the removal of UX. On p. 147 it is stated that thorium precipitated three times by ammonia is only about one one-hundredth as radioactive as ordinary thorium; the correct statement is found on p. 193. The book is well up-to-date and includes discussions of much of the most important work of the year 1905. It will give the general reader an adequate idea of the nature of the most important achievements in this field of science. It will also serve as a good introduction to the advanced treatises of J. J. Thomson and of Rutherford and to the original literature, for those who wish to study the subject thoroughly.

H. N. McCoy.

LECTURE-NOTES ON CHEMISTRY FOR DENTAL STUDENTS. By H. CARLTON SMITH, PH.G. New York: John Wiley & Sons. 1906. viii+273 pp. Price, \$2.50.

This course in dental chemistry includes the following subjects: Qualitative Analysis, Dental Metallurgy, Volumetric Analysis, Microchemical Analysis, Organic Chemistry, Physiological Chemistry, Digestion, Urine. If the students of the Harvard Dental School, for whom the course was prepared, have found it sufficient for their needs, they must be made of better stuff than ordinary students. For if the latter were reasonably familiar with elementary general chemistry, it seems clear that only the

most intelligent of them could profit by the brief treatment, which some of these topics receive. The sections on organic and physiological chemistry are painfully concise.

It is doubtless convenient to have in concise form "the data that are most likely to be of use in practical work," but students should have more than this. In the chapter on dental metallurgy is found much interesting information regarding alloys, amalgams, cements, solders, etc. In another chapter many local anesthetics are described. Nine half-tone plates with 54 figures of the crystals and the other bodies most likely to be found in micro-chemical study of the saliva, the urine, mouth-washes, and other substances of interest to dentists, should be of value to student and practitioner alike.

L. B. HALL.

CONGRESS OF ARTS AND SCIENCE, UNIVERSAL EXPOSITION, ST. LOUIS, 1904. Edited by HOWARD J. ROGERS, A.M., LL.D., Director of Congresses. Volume IV: Physics, Chemistry, Astronomy, Sciences of the Earth. Boston and New York: Houghton, Mifflin & Co. 1906 x+766 pp. Price, \$2.50 net.

The addresses presented before the Congress of Arts and Science at St. Louis, are being published in eight volumes, of which Vol. I contains the addresses on the subject of philosophy and mathematics and Vol. IV the addresses of most interest to chemists and physicists. Vol. IV contains the following addresses: The Unity of Physical Science, R. S. Woodward. The Fundamental Concepts of Physical Science, E. L. Nichols. The Progress of Physics in the Nineteenth Century, Carl Barus. The Relations of the Science of Physics of Matter to Other Branches of Learning, A. L. Kimball. Present Problems in the Physics of Matter, F. E. Nipher. The Ether and Moving Matter, D. B. Brace. The Relations of Physics of Electrons to Other Branches of Science, Paul Langevin. Present Problems of Radioactivity, Ernest Rutherford. On the Fundamental Conceptions Underlying the Chemistry of the Element Carbon, J. U. Nef. The Progress and Development of Chemistry during the Nineteenth Century, F. W. Clarke. Inorganic Chemistry—Its Relations with the Other Sciences, Henri Moissan. The Present Problems of Inorganic Chemistry, Sir William Ramsay. The Relations of Organic Chemistry to Other Sciences, Julius Stieglitz. Present Problems of Organic Chemistry, W. A. Noyes. The Relations of Physical Chemistry to Physics and Chemistry, J. H. van't Hoff. The