FRICTION AND LUBRICATION. A HANDBOOK FOR ENGINEERS, MECHANICS, SUPERINTENDENTS AND MANAGERS. By WILLIAM M. DAVIS. Second Edition, Illustrated. Pittsburg, Pa.: The Lubrication Publishing Co. 1904. 8vo. 265 pp.

This work considers the subject from the practical or mechanical point of view and, being intended more particularly for the classes of men noted on the title page, is presented in a plain and concise way. The subject is one, as the author notes, which has not received the attention that it deserves or that it would pay to give it.

The subjects treated embrace those of friction and friction losses, the theory of lubrication and the lubrication of different varieties of machinery, as engines of all kinds, mining, refrigerating, textile, flour mill, compressed air, steel works, machinery, cars, etc., etc.; particular attention being paid to cylinder and valve oiling. Bearings, journals and bearing metals receive considerable attention, as do also the testing and properties of the various oils and greases. Oiling devices and a chapter upon oil house methods, oil storage and gauging complete the volume.

The book fills a long-felt want and the reviewer knows of no other treatise in which the difficulties incident to lubrication, as the groaning of valves, the cutting and scoring of cylinders and the various experiences with all sorts of lubrication are so fully and ably considered. The method described for the determination of the percentage of animal or vegetable oil in a compound oil, as described, would give high results, due to the fact that the ether solution of the petroleum oil contains soap not having been washed with water.

The work is a most excellent one and may be recommended to every one having to do with oils. A. H. GILL.

PERCENTAGE TABLES FOR ELEMENTARY ANALYSIS. By LEO F. GUTTMANN, PH.D., A.C.G.I., A.I.C. London and New York: Whittaker & Co. 1904. 43 pp.

This book gives tables for calculating the percentages of carbon and hydrogen in organic combustions. There are, besides, a table of proportional parts for use in interpolating and a table giving the weight of a cubic centimeter of moist nitrogen at different temperatures and pressures. The latter is based upon Dietrich's table,[1] and the values given are, therefore, about 0.50 per cent. higher than they should be for "chemical" nitrogen.[2] The tables

[1] *Z. anal. Chem.*, **5**, 36 (1866).

[2] Rayleigh and Ramsay: *Z. physik. Chem.*, **16**, 346 (1895.)

will be found very useful in laboratories where many organic combustions are made. C. E. WATERS.

THE NEW KNOWLEDGE A POPULAR ACCOUNT OF THE NEW PHYSICS AND THE NEW CHEMISTRY IN THEIR RELATION TO THE NEW THEORY OF MATTER BY ROBERT KENNEDY DUNCAN New York 1905

Our lately acquired knowledge of the phenomena of radioactivity is now so considerable that a popular summary of the whole subject is very desirable. The author of this book, who says that "the world is divided between men who know and cannot tell and men who tell and cannot know," has attempted to supply this desideratum, justifying the attempt, "because of the need of some interpretation of this new and interesting knowledge, and because of his own sincerity.

The work is much to be commended to those for whom it has been written; that is, to teachers who have no convenient access to the original papers of numerous scientific journals, to students and those who have been students, and to the general public. It contains a clear and orderly statement of the facts of radioactivity so far observed, as well as of some related and longer known facts needed in the discussion of the former.

Part First is entitled "Current Conceptions;" it concludes with definitions of the terms *compound*, *element*, *molecule*, and *atom* such as have been received for half a century. The succeeding five parts treat of "The Periodic Law," of "Gaseous Ions," of "Natural Radioactivity, a New Property of Matter," of the "Resolution of the Atom, ' and of "Inorganic Evolution."

They well state observed facts and the more special theoretical conclusions suggested by them. The concluding seventh part is entitled "The New Knowledge and the Old Problems," and states the more general theoretical conclusions. It discusses the source of the sun's heat, the age of the earth, the nature of the tails of comets, solar prominences and the solar corona, the zodiacal light, the aurora borealis, and the possible reconstruction of a universe which shall have become extinct by losing all its available energy. In one chapter of this seventh part, the terms defined in the first part are defined anew in a way which well sums up the recent increase of our knowledge and the wealth of fruitful and useful conjecture derived from it. Such conjectural conclusions are carefully represented as tentative and provisional, and it will not be the fault of the author if some recent hypotheses are accepted