

of *Skimmia Japonica* Thunb., and to which the formula $C_{32}H_{29}O_9N_3$ was assigned.

The alkaloids are classified alphabetically. The subject-matter is well presented, with full references to the literature, and the monograph constitutes an excellent resumé of the progress of alkaloidal chemistry in 1904. It should be on file in all laboratories interested in this field of organic chemistry.

MARSTON TAYLOR BOGERT.

EXERCISES IN QUANTITATIVE CHEMISTRY. By HARMON NORTHROP MORSE, Professor of Analytical Chemistry in the Johns Hopkins University. Boston: Ginn and Co. 1905. 556 pp. Price, \$2.00.

This book is a highly satisfactory collection of well explained quantitative exercises. It is noteworthy for combining many physico-chemical measurements with the most varied exercises in quantitative analysis. The chapter headings include: The balance, barometer, thermometer; calibration of apparatus for measuring gases and liquids; standard solutions; determination of specific gravities and molecular weights; purification; estimation of silver, the halogens, sulphur, nitrogen, phosphorus, arsenic, silicates, carbon dioxide, carbon, hydrogen, alkalies and alkaline earths; gas analysis; volumetric analysis; electro-analysis; butter analysis; electrical heating appliances; electrical methods for combustion of organic substances.

The author thinks that a list of this sort will give an average student the best possible foundation for subsequent work, whether in physical, organic, inorganic or *analytical* chemistry. But in the opinion of the reviewer the list is much longer than could possibly be assigned even for the bulk of a full year's work. In the next place it merely takes little slices from courses, units in themselves, which the student should have later anyway, *e. g.*, physical or organic chemistry. Viewed in this light, therefore, the course seems adapted for students who might not go further in some of the fields treated, *e. g.*, gas analysis; but candidates for the doctorate would secure a more symmetrical development by taking each special field in turn, after an early course in gravimetric and volumetric analysis.

But this list is a step in the right direction. Here are taught varied principles, together with varied quantitative methods. The scrutiny of instruments and their calibration belongs here, as befitting quantitative work, for instruments often tell as wrong

stories as chemical labels. Only by realizing all of these matters does a student see the meaning of the *tenths of a per cent.* The electrical way of making organic combustions seems worthy of general adoption.

This shows the spirit of the book. With the good points, however, some mistakes ought to be pointed out. There is no distinction between work and energy, so the watt is wrongly defined; it measures the rate of consumption or production of energy, *i. e.*, it is a joule per second. It should be stated that Thomson's rule gives only an approximate decomposition value (p. 494). On p. 24, if the weights of a set have been calibrated with one another as they should be, it is *not* necessary to consider the different densities of the small platinum and large brass weights, to reduce to vacuum, for the difference in buoyancy is automatically eliminated by the calibration. Silver chloride can be better washed by decantation than by rinsing it after it is on the Gooch filter. In electro-analysis no mention is made of the enormous saving of time effected by a rotating anode. A mercurous salt is better than ferric chloride for purifying mercury and of course its mercury is regained as pure substance. Nine significant figures for an oxygen equivalent on p. 456 look bad. Atomic weights should be on the oxygen basis.

Of course this work makes no attempt to supplant a great many special treatises. On the whole, teachers ought to find this a suggestive book, and students could profit much by owning it.

ROGER C. WELLS.

CHEMISCHE-TECHNISCHE UNTERSUCHUNGSMETHODEN, HERAUSGEGEBEN VON DR. GEORG LUNGE. Vol. III, with 119 cuts and 3 plates. 8vo. pp. xxvii+1305+44. Fifth completely revised and enlarged edition. 1905. Berlin: Julius Springer. Price, 28.50 marks.

This work is so universally and favorably known that the reviewer deems it best to show wherein it differs from the preceding edition.

The chapters on Oils, Fats and Waxes and Special Methods in the Oil and Fat Industry by Lewkowitsch*, Manchester, on Rubber and Rubber Goods by Frank and Marckwald of Berlin, and on Beer by Prof. Lintner, Munich, are new, these writers contributing for the first time to the treatise.

Other subjects and authors are as follows: Mineral Oils and Lubricants,* Prof. Holde, Berlin; Drugs, Resins, Balsams and