We admire the author's aim in making the calculus the center and unity of the book, and his position in claiming that "the calculus cannot be successfully applied to the problems which occur in actual practice until the student has become thoroughly familiar with its underlying principles and methods, and this familiarity can only be obtained by steady practice. It is unfair to a student to give him as a standard form

$$\int x^n dx = \frac{x^{n+1}}{n+1}$$

and then expect him to use it as a formula to integrate any function which might resemble it, or by some means reduce to it. This might be working along the line of least resistance, but it is not educational: neither is it to the best interests of the student to whom sound work in differentiation and integration is an absolute necessity."

The text closes with a list of the answers to all the hundreds of exercises and an index. Example 27, page 17, attracted our attention, so we solved it only to find the "true value" .34315 instead of .3429 in the first part, and in the second part .3774 instead of .3781, making the percentage of error 0.318 instead of 0.503 per cent as printed. The difference is probably due to the fact that we rationalized the denominators and divided. The answers should not be carried out so far at any rate.

The publishers have made the book attractive; even the relative dimensions as well as the appearance of the pages are inviting.

CHARLES C. GROVE.

NOTES.

THE April meeting of the Chicago Section of the American Mathematical Society will be devoted in part to a symposium on divergent series and modern theories of summability, the principal speakers being R. D. CARMICHAEL and C. N. MOORE.

AT the annual meeting of the Mathematical Association of America E. V. HUNTINGTON was elected president, D. N.

LEHMER and J. W. YOUNG vice-presidents, and W. D. CAIRNS secretary-treasurer. By amendment of the constitution the office of managing editor was divided, and H. E. SLAUGHT was appointed manager and R. D. CARMICHAEL editor-in-chief of the *Monthly*. The attendance at the meeting numbered 119, including 94 members; 27 persons and institutions were elected to membership. The finances of the association are evidently well managed, the treasurer's report showing a gain of about one hundred dollars for the past year, notwithstanding the cost of the *Monthly*, the subvention paid to the *Annals of Mathematics*, and a small fund set aside for the work of the national committee on mathematical requirements.

THE opening (January) number of volume 19 of the *Transactions of the American Mathematical Society* contains the following papers: "Rational approximations to irrational complex numbers," by L. R. FORD; "On the imaginary roots of a polynomial and the real roots of its derivative," by H. B. MITCHELL; "Relations entre les notions de limite et de distance," by MAURICE FRÉCHET; "On the foundations of the calcul fonctionnel of Fréchet," by A. D. PITCHER and E. W. CHITTENDEN; "Existence theorems for the general real self-adjoint linear system of the second order," by H. J. ETTLINGER; "On boundary value problems in linear differential equations in general analysis," by T. H. HILDEBRANDT; "A fundamental system of formal covariants modulo 2 of the binary cubic," by O. E. GLENN.

THE opening (January) number of volume 40 of the *American Journal of Mathematics* contains: "Flat-sphere geometry. Second paper," by JOHN EIESLAND; "Irrational involutions on algebraic curves," by J. V. DEPORTE; "The set of eight self-associated points in space," by J. R. MUSSELMAN; "Associate minimal surfaces," by J. K. WHITTEMORE; "On integral invariants," by F. W. REED; "Fundamental regions for certain finite groups in S_4," by H. F. PRICE.

THE November number (volume 3, number 11) of the *Proceedings of the National Academy of Sciences* contains the following mathematical papers: "A necessary and sufficient condition for the existence of a Stieltjes integral," by G. A. BLISS; "Transformations of applicable conjugate nets of curves on surfaces," by L. P. EISENHART; "On bilinear and n-linear functionals," by C. A. FISCHER; "On the deformation

of an n-cell," by OSWALD VEBLEN; "A theorem on series of orthogonal functions with an application to Sturm-Liouville series," by G. D. BIRKHOFF.

AT the annual meeting of the British mathematical association held on January 10, 1918, the following papers were read: By W. P. MILNE, "Uses and functions of a school mathematical library"; by S. BRODETSKY, "Nomography"; by G. GOODWILL, "Some suggestions for the presentment of mathematics in closer touch with reality"; by T. P. NUNN (presidential address), "Mathematics and individuality."

AT the meeting of the Edinburgh mathematical society on January 11, the following papers were read: By Miss E. PAIRMAN, "On a difference equation due to Stirling"; by E. T. WHITTAKER, "On Bernoulli's and Fürstenau's methods for the solution of equations"; by E. M. HORSBURGH, "An approximate formula for the length of an arc of a suspended rope."

AT the annual meeting of the Paris academy of sciences, held December 10, 1917, the following prizes in pure and applied mathematics were awarded, in addition to those noted in the February number of the BULLETIN: The Lalande prize to Mr. R. JONCKHEERE for his catalogue of double stars; the Valz prize to Dr. A. SCHAUMASSE, of the University of Nice, for the discovery of the comet 1917 b; the Petit d'Ormoy prize to Professor P. DUHEM, of the University of Bordeaux, for his cosmological theories of the earth; the Binoux prize to Professor G. TEIXEIRA, of the University of Porto, for his mathematical works, and honorable mention to Mr. A. BORDEAUX; the Saintour prize to Professor H. LEBESGUE for his contributions to the principles of the calculus; the de Parville prize to Professor C. J. DE LA VALLÉE POUSSIN for his Course of infinitesimal analysis and Lessons on. Lebesgue integrals. The Vaillant, Damoiseau, Fourneyron, Pontecoulant, Pierson-Perrin, and Guzman prizes were not awarded.

All the prizes are to be awarded in 1918 and following years under the usual conditions. The following prize questions are proposed: For the Damoiseau prize (2000 francs) to be awarded in 1920: "To improve in some important points the work of Poincaré and Liapounoff on the figures of equilibrium of a rotating fluid mass subject to newtonian attraction. The

Academy calls especial attention to the question of stability and the study of infinitesimal oscillations about a stable figure." For the Bordin prize (3000 francs) to be awarded in 1919: "In the theory of integrals of total differentials of the third kind and of double integrals relative to an algebraic function of two independent variables, there has been proved the existence of certain integers, whose value is difficult to obtain and may depend on the arithmetic nature of the coefficients of the equation of the surface corresponding to the function. The Academy asks a detailed study of these numbers in some important special cases." For the Grand prize (3000 francs) to be awarded in 1920: "To improve the theory of the functions of one variable that can be represented by trigonometric series of several arguments that are linear functions of that variable."

THE following university and college teachers of mathematics have recently entered the national military service:

Professor J. L. COOLIDGE, of Harvard University, has been commissioned major in the ordnance department and sent to Europe as head of a scientific mission. Mr. W. E. EDINGTON, of the University of Illinois, has joined the research division of the Signal Service Bureau at Leavenworth, Kan. Dr. L. R. FORD, of Harvard University, has joined the coast artillery. Dr. L. M. KELLS, of the University of Illinois, has entered the officers' reserve training camp at Battle Creek, Mich. Mr. F. D. POSEY, of Lebec, Cal., has been made second lieutenant in the national army. Mr. J. L. WALSH, of Harvard University, has joined the naval reserve.

PROFESSOR VITO VOLTERRA, of the University of Rome, has been elected a foreign associate of the Paris academy of sciences.

AT the University of Illinois, Dr. J. E. McATEE, of William Jewell College, and Mr. L. L. STEIMLEY, of the University of Kansas, have been appointed instructors in mathematics. Dr. J. R. MUSSELMAN has resigned his instructorship to enter statistical work in one of the government departments at Washington. Mr. H. D. FRARY has resigned to become director of the wood-testing plant for aeroplanes at the University of Wisconsin. Mr. A. W. LARSEN has resigned to accept an instructorship at the University of Kansas.

PROFESSOR ELLERY W. DAVIS, dean of the school of arts and sciences and head of the department of mathematics of the University of Nebraska, died February 3 at the age of sixty years. Professor Davis was one of the earliest members of the American Mathematical Society, having entered in 1891.

DR. R. A. HARRIS, of the U. S. coast and geodetic survey and well known for his researches in the theory of the tides, died January 17 at the age of fifty-four years.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

BOUTROUX (E.). Natural law in science and philosophy. Authorized translation by F. Rothwell. New York, Macmillan, 1914. 8vo. 218 pp.

"F. R. S." See THOMPSON (S. P.).

HANCOCK (H.). Theory of maxima and minima. Boston, Ginn, 1917. 8vo. 14 + 193 pp.

KENYON (A. M.) and LOVITT (W. V.). Mathematics for collegiate students of agriculture and general science. New York, Macmillan, 1917. 8 + 357 pp. Cloth. $2.00

LOVITT (W. V.). See KENYON (A. M.).

MAURUS (E. J.). An elementary course in differential equations. Boston, Ginn, 1917. 12mo. 8 + 51 pp. $0.72

ROTHWELL (F.). See BOUTROUX (E.).

THOMPSON (S. P.). ("F. R. S."). Calculus made easy: being a very-simplest introduction to those beautiful methods of reckoning which are generally called by the terrifying names of the differential calculus and the integral calculus. Second edition, enlarged. London, Macmillan, 1917. 12mo. 12 + 265 pp. 2s.

ZONDADARI (E.). Integrazione grafica e studio delle equazioni differenziali ordinarie del primo ordine coi metodi della geometria descrittiva. Milano, Soc. ed. Dante Alighieri (Roma, tip. Nazionale, Bertero), 1917. 8vo. 9 + 112 pp. L. 3.50

II. ELEMENTARY MATHEMATICS.

BARKER (E. H.). Plane trigonometry with tables. Philadelphia, Blakiston, 1917. 8vo. 8 + 172 pp.

CHADSEY (C. E.) and SMITH (J. H.). Efficiency arithmetic. 3 volumes. Boston, Atkinson, Mentzner and Company, 1917. 12mo. Primary: 7 + 280 pp. Intermediate: 6 + 282 pp. Advanced: 5 + 314 pp. $0.40 + 0.40 + 0.45