can work out for itself the polar element of volume; it is more than most of us can do to draw a decent figure and give the proof for the class.

We have heard a great deal off and on about the necessity of giving the student power and the spirit of investigation; but this is merely a visionary's ideal, as anybody can see by pondering upon the question: How many of our doctors of philosophy in mathematics in this country or abroad are engaged in real research? If six to eight years of training lapse into desuetude in the case of professional mathematicians, what can you expect to accomplish with sophomores? Put into the text what you want them to know in such form that they can learn it, say I, and then see that they do learn it. And I have heard a very eminent investigator recommend the same sort of thing for candidates for the doctorate.

There is no need of going into the details, whether bad or good, of Davis's text. Suffice it to say that if books are not more carefully written, we shall have to refrain from adopting them from very lack of time to examine them in sufficient detail to make it safe to adopt them; but it is too bad to throw the whole reponsibility upon the user instead of upon the author and publisher, where we previously thought it belonged, at least to a very large extent.

Vivanti's book of exercises, a companion to his Lezioni d'analisi infinitesimale, contains 575 well-selected solved exercises in calculus; there are no applications and no rigorous types. The list should be of value to American writers of texts, but it is difficult to see how it can be of direct use in our classes.

EDWIN BIDWELL WILSON.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

NOTES.

THE April number (volume 16, number 2) of the *Transactions of the American Mathematical Society* contains the following papers: "Quartic curves modulo 2," by L. E. DICKSON; "Mixed linear integral equations of the first order," by W. A. HURWITZ; "Prime power groups in which every commutator of prime order is invariant," by W. B. FITE; "On

the order of primitive groups," by W. A. MANNING; "A proof of the invariance of certain constants of analysis situs," by J. W. ALEXANDER, II; "Point sets and allied Cremona groups," by A. B. COBLE; "Scroll directrix curves," by C. T. SULLIVAN.

THE April number (volume 37, number 2) of the *American Journal of Mathematics* contains: "Invariantive theory of plane cubic curves modulo 2," by L. E. DICKSON; "On the projective differential classification of n-dimensional spreads generated by ∞^1 flats," by ARTHUR RANUM; "On the order of a restricted system of equations," by F. F. DECKER; "One-parameter families of curves," by L. P. EISENHART; "On a porism connected with the theory of Maxwell's equations and a method of obtaining the lines of electric force due to a moving point charge," by H. BATEMAN; "The abstract definitions of groups of degree 8," by JOSEPHINE E. BURNS.

THE Association of mathematics teachers of New Jersey held its second regular meeting at Trenton on May 1. Papers were read by OSWALD VEBLEN: "The affine geometry"; RICHARD MORRIS: "The auxiliary angle"; FLETCHER DURELL: "Mathematics and efficiency"; A. W. BELCHER: "First year mathematics for a technical high school"; C. O. GUNTHER: "Trigonometry for the college student"; J. W. COLLITON: "The study conference plan in mathematics"; H. E. WEBB: "Geometric definition of the trigonometric functions" and "Outline of a course in advanced commercial algebra." Professor H. B. FINE was elected president of the association.

THE Adams prize for the year 1913–1914 has been awarded to G. I. TAYLOR (Trinity, 1910). The title of the prize memoir is: "The phenomena of the disturbed motion of fluids, including the resistances encountered by bodies moving through them." The value of the prize is about £250.

THE early publication of an Analytic Mechanics, by J. A. MILLER and S. B. LIBBY, of Swarthmore College, is announced by D. C. Heath and Company.

UNIVERSITY OF CALIFORNIA.—The following advanced courses are announced for the summer session, June 21 to July 31:—By Professor M. W. HASKELL: Constructions by

ruler and compass.—By Professor C. J. KEYSER: Analytical geometry of three dimensions; History and significance of central mathematical ideas and doctrines.—By Professor H. W. TYLER: History of mathematical science.—By Professor T. M. PUTNAM: Three famous problems of geometry; Theory of functions of a complex variable.

DR. E. S. ALLEN, of Brown University, has been appointed instructor in mathematics at the University of Michigan.

PROFESSOR J. J. HARDY, who had held the chair of mathematics and astronomy at Lafayette College since 1876, died May 2, 1915, at the age of seventy-one years.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

CAJORI (F.). History of mathematics. 2d reprint. New York, Macmillan, 1913. 8vo. 422 pp. $3.50

CAMPBELL (D. F.). A short course on differential equations. 5th reprint. New York, Macmillan, 1913. 12mo. 123 pp. $0.90

——. Elements of the differential and integral calculus. 4th reprint. New York, Macmillan, 1913. 12mo. 362 pp. $1.90.

CARVALLO (E.). Le calcul des probabilités et ses applications. Paris, Gauthier-Villars, 1912. 8vo. 9+169 pp.

CREMONA (L.). Opere matematiche. Tomo II. Milano, Hoepli, 1915. 4to. 459 pp. L. 25.00

ENCYKLOPÄDIE der mathematischen Wissenschaften. Band II 2, Heft 4: E. Hill, Lineare Differentialgleichungen im komplexen Gebiet. Leipzig, Teubner, 1915. Gr. 8vo. Pp. 471–562. M. 2.80

FINE (H. B.) and THOMPSON (H. D.). Coördinate geometry. 5th reprint. New York, Macmillan, 1914. 12mo. 300 pp. Half leather. $1.60

HAEUSSLER (J. W.). Geometrischer und algebraischer Beweis des Fermatschen Satzes durch Ausziehen der n-ten Wurzel und durch Ableitung des Satzes als ganzzahlige Ungleichung. Berlin, M. Krayn, 1912. 8vo. 48 pp.

HILL (E.). See ENCYKLOPÄDIE.

LA MARCA (R.). Criterî di congruenza e criterî di divisibilità. Esercizî varî. Torre del Greco, Pantaleo, 1912. 8vo. 30 pp.

LASKA (W.). Einleitung in die geometrische Funktionentheorie. 2te Auflage. Bremerhaven, 1915. Gr. 8vo. 6+87 pp. M. 2.00

NEKRASSOW (P. A.). Theory of probabilities. 2d edition, with the addition of the statistical theory of correlation and the elements of nomography. (In Russian.) St. Petersburg, 1912. 8vo. 36+532 pp.

RIGGS (N. C.). Analytic geometry. 8th reprint. New York, Macmillan, 1914. 12mo. $1.60

THOMPSON (H. D.). See FINE (H. B.).