NOTES.

THE April number (volume 4, number 2) of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY contains the following papers : " The approximate determination of the form of Maclaurin's spheroid," by G. H. DARWIN ; " On twisted cubic curves that have a directrix," by H. S. WHITE ; " Ueber Curvenintegrale im m-dimensionalen Raum," by L. HEFFTER ; " The generalized Beltrami problem concerning geodesic representation," by E. KASNER ; " On the holomorph of a cyclic group," by G. A. MILLER ; " Quadric surfaces in hyperbolic space," by J. L. COOLIDGE; " Ueber die Reducibilität der reellen Gruppen linearer homogener Substitutionen," by A. LOEWY ; " On the possibility of differentiating term by term the developments for an arbitrary function of one real variable in terms of Bessel functions," by W. B. FORD ; " On a certain congruence associated with a given ruled surface," by E. J. WILCZYNSKI ; " On the class number of the cyclotomic number field $k(e^{2\pi i/p^n})$," by J. WESTLUND.

THE San Francisco Section of the AMERICAN MATHEMATICAL SOCIETY will hold its third regular meeting at Stanford University, on Saturday, April 25, 1903.

THE twenty-fifth anniversary of the founding of the Yale Mathematical Club was celebrated on January 20th by a dinner given by Mr. George E. Dimock, at which the members of the Yale mathematical faculty, graduate students and several invited guests were present. Professor Phillips acted as toastmaster and responses were made by ex-President Dwight, President Hadley, Professors Gibbs, Pierpont, Smith and others. The club was founded by Professor Gibbs, and among the more important papers presented at its meetings have been Professor H. A. Newton's later researches on meteors, and Professor Gibbs's development of his vector analysis. Several facts of historical interest to the department were recalled, among which the following may be of general interest. In 1714 the first (recorded) mathematical books were placed in the Yale College library, among which were copies of Newton's Optics, and the second edition of his Principia which were presented to the college

by Sir Isaac Newton himself. The acquisition of these and other books evidently stimulated the study of mathematics, and previous to 1866 courses in conic sections and fluxions were given at Yale, which was the first college in America to include higher mathematics in its curriculum. It was also recalled that before 1860 no less than three Yale instructors, Professors Stanley, Loomis, and Newton availed themselves of extended periods of study in France and England, being among the pioneer American mathematicians in foreign study.

THE next meeting of the Deutsche Mathematiker-Vereinigung will be held, in connection with the seventy-fifth meeting of the association of German naturalists and physicians, at Cassel, September 20–26, 1903. Abelian functions and theoretical mechanics are especially proposed as centers of discussion at this meeting.

THE several German universities below offer during the summer semester of the current academic year courses in mathematics as follows:

UNIVERSITY OF BONN.—By Professor H. KORTUM : Exercises in the mathematical seminar, two hours ; Infinite series, two hours ; Elements of differential and integral calculus, four hours.—By Professor R. LIPSCHITZ : Exercises in the mathematical seminar, two hours ; Application of the infinitesimal calculus to the theory of space, four hours.

UNIVERSITY OF BRESLAU.—By Professor J. ROSANES : Exercises in the mathematical seminar, one hour ; Analytic geometry of the plane, four hours ; Elements of the theory of determinants, two hours.—By Professor R. STURM : Exercises in the mathematical seminar, two hours ; Theory of geometric transformations, part I, four hours ; Descriptive geometry and graphic statics, three hours. By Professor F. LONDON : Theory of definite integrals and of Fourier's series, three hours.

UNIVERSITY OF ERLANGEN.—By Professor P. GORDAN : Geometry of space, four hours ; Theory of numbers, four hours ; Exercises in the seminar, three hours.—By Professor M. NOETHER : Differential and integral calculus, II, four hours ; Geometric and analytic exercises.

UNIVERSITY OF FREIBURG.—By Professor J. LÜROTH : Higher analytic geometry of curves and surfaces, four hours ; Theoretic astronomy, three hours.—By Professor L. STICKEL-

BERGER : Integral calculus, five hours ; Elliptic functions, three hours ; Mathematical seminar. By Professor A. LOEWY : Theory of algebraic equations, four hours ; On the foundations of geometry, two hours.

UNIVERSITY OF GIESSEN.—By Professor M. PASCH : Analytic geometry of the plane, four hours ; General expedients in the theory of functions, two hours ; Exercises in the mathematical seminar, one hour.—By Professor E. NETTO : Introduction to algebra, four hours ; Differential equations, two hours ; Exercises in the mathematical seminar, one hour.—By Professor J. WELLSTEIN : Descriptive geometry, second part, with exercises, six hours ; Introduction to the geometry of position, two hours ; Arithmetic theory of forms, two hours.

UNIVERSITY OF GÖTTINGEN.—By Professor FELIX KLEIN : Encyclopædia of geometry, four hours ; Mathematical seminar, two hours.—By Professor D. HILBERT : Differential equations, four hours ; Mechanics of continua, two hours ; Exercises in the mathematico-physical seminar, two hours.—By Professor M. BRENDEL : Insurance, two hours ; Exercises in the integration of differential equations, two hours ; Special perturbations, two hours ; Mathematical exercises in the insurance seminar, two hours.—By Professor F. SCHILLING : Differential and integral calculus, I, four hours ; Graphic statics, one hour ; Exercises in graphic statics, two hours.—By Dr. E. ZERMELO : Analytic geometry, four hours ; Exercises in the integration of differential equations, two hours.—By Dr. O. BLUMENTHAL : Elliptic and modular functions, three hours ; Exercises in the integration of differential equations, two hours.

UNIVERSITY OF HALLE-WITTENBERG.—By Professor G. CANTOR : Differential and integral calculus, five hours ; Exercises in the mathematical seminar, one hour.—By Professor A. WANGERIN : Differential equations, four hours ; Analytic geometry of the plane, three hours; Spherical trigonometry and mathematical geography, three hours ; Exercises in the mathematical seminar, one hour. By Professor H. GRASSMANN : Application of descriptive geometry to surfaces of the second degree, with exercises, two hours.—By Professor H. BUCHHOLZ : Probabilities and the method of least squares, two hours ; Practical exercises in determination of geographic position, for mathematicians and geographers, two hours.—By Dr. F. BERNSTEIN :

Foundations of geometry, two hours; Exercises in the founda-
tions of geometry, one hour.

UNIVERSITY OF HEIDELBERG.—By Professor L. KÖNIGS-
BERGER: Differential and integral calculus, four hours; Theory
of functions, four hours; Seminar, two hours.—By Professor M.
CANTOR: Application of analysis to higher algebraic plane
curves, four hours; Arithmetic and algebra, three hours.—By
Professor F. POCKELS: Partial differential equations of physics,
two hours.—By Professor F. EISENLOHR: Probabilities, three
hours.—By Professor K. KOEHLER: Plane analytic geometry,
three hours.—By Professor G. LANDSBERG: Theory of deter-
minants and invariants, four hours; Selected chapters in the
theory of algebraic functions, two hours.—By Dr. K. BOEHM:
Theory of elliptic functions.

UNIVERSITY OF JENA.—By Professor J. THOMAE: Plane
analytic geometry, four hours; Mathematical geography, four
hours.—By Professor A. GUTZMER: Differential calculus, with
exercises, five hours; Introduction to the theory of differential
equations, five hours.—By Professor G. FREGE: Riemann's
theory of functions, four hours; Mathematical exercises, two
hours.

UNIVERSITY OF KIEL.—By Professor L. POCHHAMMER:
Plane analytic geometry, four hours; Theory of definite
integrals, four hours; Introduction to probabilities, one hour;
Exercises in the mathematical seminar, one hour.—By Profes-
sor P. STÄCKEL: Differential calculus and introduction to
analysis, four hours; Curvature of surfaces, one hour; Analytic
mechanics, four hours; Exercises in the mathematical seminar,
on mechanics, one hour.—By Professor E. KOBOLD: Ele-
mentary geodesy, two hours; Exercises in geodesy, one hour.

UNIVERSITY OF LEIPSIC.—By Professor K. NEUMANN:
Differential and integral calculus, three hours; Mathematical
seminar, two hours.—By Professor A. MAYER: Ordinary dif-
ferential equations, four hours, with exercises.—By Professor
O. HÖLDER: Applications of elliptic functions, three hours;
Projective geometry treated synthetically, three hours; Math-
ematical seminar, one hour.—By Professor F. ENGEL: Analy-
tic geometry, four hours; Theory of transformation groups,
two hours; Algebraic equations, two hours; Mathematical semi-
nar, one hour.—By Professor F. HAUSDORFF: Differential
geometry, four hours; Exercises, one hour.

UNIVERSITY OF MARBURG.—By Professor E. HESS : Plane geometry treated analytically and synthetically, four hours ; Selected chapters from higher analysis, four hours; Exercises in the mathematical seminar, three hours. — By Professor K. HENSEL : Differential calculus, five hours ; Theory of algebraic functions of a single variable and their application to the theory of algebraic curves and of the abelian integrals, four hours ; Seminar, two hours.—By Dr. F. VON DALWIGK : Theory of functions, five hours ; Geodesy, two hours.—By Dr. H. JUNG : Theory of numbers, four hours ; Algebra, II, two hours.

UNIVERSITY OF ROSTOCK.—By Professor O. STAUDE : Differential and integral calculus, four hours ; Seminar, two hours.

UNIVERSITY OF STRASSBURG.—By Professor T. REYE : Selected chapters from the higher synthetic geometry, three hours ; Theory of potential, three hours ; Exercises in the seminar, two hours.—By Professor H. WEBER : Definite integrals and the introduction to the theory of functions, four hours ; Higher algebra, four hours ; Exercises in the seminar, two hours. By Professor G. ROTH : Differential and integral calculus, three hours ; Exercises in differential and integral calculus, two hours ; Plane analytic geometry, three hours.—By Professor M. DISTELI : Analytic geometry of space, three hours ; Descriptive geometry, II, two hours ; Exercises in descriptive geometry, four hours ; Exercises in the seminar, two hours.

UNIVERSITY OF TÜBINGEN.—By Professor A. VON BRILL : Analytic geometry of space, three hours ; Theory of curvature of surfaces, four hours ; Exercises in the seminar, two hours.— By Professor H. STAHL : Elementary analysis, three hours ; Higher analysis, three hours ; Exercises in each, one hour.— By Professor L. MAURER : Descriptive geometry, two hours ; One-valued functions of a complex variable, two hours ; Exercises in descriptive geometry, two hours : Exercises in the theory of functions, one hour.

THE February number of the *Popular Science Monthly* contains a statistical study by Professor J. McK. CATTELL of eminent men of the past. Professor Cattell's list of a thousand names, selected according to the space devoted to them in six representative encyclopædias and biographical dictionaries, includes the following mathematicians : Newton (14th), Descartes

(23d), Leibnitz (34th), Pascal, Pythagoras, Napier, Laplace, Lagrange, Huygens, Archimedes, Cardan, Dupin, Euclid, Euler, Monge, Gauss, Fermat. The order of the names is based of course on general, not mathematical, reputation.

THE Mathematical society of France has elected as its president for 1903, Professor P. PAINLEVÉ. The four new members of the council are MM. KOENIGS, LECORNU, R. PERRIN, and TOUCHE. Professor G. MITTAG-LEFFLER has been made an honorary member, the second foreign member of the Society, the other being Professor L. CREMONA.

PROFESSOR H. POINCARÉ has been elected a corresponding member of the Brussels academy.

PROFESSOR P. APPELL has been elected dean of the Paris faculty of sciences, succeeding Professor G. DARBOUX, who has been made honorary dean.

PROFESSOR JOSEPH LARMOR, fellow of St. John's College, Cambridge, and secretary of the Royal society, has been elected Lucasian professor of mathematics, succeeding the late Sir George Gabriel Stokes.

IT is proposed by Cambridge University to secure an appropriate memorial of the late Sir G. G. STOKES. For this purpose a committee has been appointed consisting of the chancellor, vice-chancellor, Professors Jebb, Forsyth, Darwin, Ball, Thomson, and W. Burnside.

PROFESSOR J. J. THOMSON, of Cambridge, England, will deliver at Yale University, beginning May 14, a course of eight lectures on "Recent developments in our ideas of electricity." These lectures are the first to be given on the Silliman foundation at Yale.

IN the investigation undertaken by the aid of the Carnegie Institution into certain phases of geophysical problems common to mathematics, astronomy, physics, chemistry and geology, mathematics is to be represented by Professors C. S. SLICHTER, of the University of Wisconsin, and L. M. HOSKINS, of Leland Stanford University.

DR. M. B. PORTER has resigned his position as assistant professor of mathematics in the academic department of Yale

University, to accept the professorship of mathematics recently offered him at the University of Texas, where he will have full charge of the department of mathematics.

DR. G. A. MILLER has been promoted from an assistant to an associate professorship of mathematics at Stanford University.

DR. F. R. MOULTON has been promoted to an assistant professorship of mathematics at the University of Chicago.

THE deaths are announced of Professor F. J. STUDNICKA, of the Bohemian University of Prague, and of Professor ANTON PUCHTA, of the University of Czernowitz.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

AKULOV (L. A.). See PERRY (J.).

BALL (W. W. R.). Breve compendio di storia delle matematiche. Versione dall'inglese, con note, aggiunte e modificazioni di D. Gambioli e G. Puliti, riveduta e corretta da G. Loria. Vol. I: Le matematiche dall'antichità al rinascimento. Versione di G. Puliti, con una nota originale su la scuola pitagorica. Bologna, Zanichelli, 1903. 8vo. 10 + 284 pp. Fr. 8.00

BAZHINSKY (V. V.). See PERRY (J.).

BÔCHER (M). See BRIGGS (G. R.).

BOREL (E.). Leçons sur les fonctions méromorphes, professées au Collège de France, recueillies et rédigées par L. Zoretti. Paris, Gauthier-Villars, 1903. 8vo. 6 + 124 pp. (Nouvelles leçons sur la théorie des fonctions, 4e partie.) Fr. 3.50

BRIGGS (G. R.). The elements of plane analytic geometry: a text-book, including numerous examples and applications, and especially designed for beginners. 7th edition, revised and enlarged by M. Bôcher. New York, Wiley, 1903. 12mo. 5 + 191 pp. Cloth.
$1.00

CATALOG mathematischer Modelle für den höheren mathematischen Unterricht, veröffentlicht durch die Verlagshandlung von Martin Schilling in Halle a. S. 6te Auflage. Halle, 1903. 8vo. 130 pp. Cloth.
M. 1.00

CHARASOFF (G.). Arithmetische Untersuchungen über Irreduktibilität. (Diss.) Heidelberg, 1902. 8vo. 67 pp.

DU BOBERIL (R). Pascal et Riemann. Paris, Dubois, 1902. 18mo. 22 pp.

FORMULARIO di geometria analitica. Torino, Bertero, 1902. 8vo. 14 pp.

GAMBIOLI (D.). See BALL (W. W. R.).