NOTES.

THE opening (January) number of volume 31 of the *American Journal of Mathematics* contains the following papers: "The quadric spreads connected with the configuration $\Gamma^{n+2}_{n+4,n}$ and a special case in the Pascal hexagram," by W. B. CARVER; "The group membership of singular matrices," by A. RANUM; "Methods to determine the primitive roots of a number," by G. A. MILLER; "Standard forms of certain types of Peirce algebras," by J. B. SHAW; "On the law of gravitation in the binary systems," by F. L. GRIFFIN; "Lösung des Lehmer'schen Problems," by E. LANDAU.

THE next meeting of the Deutsche Mathematiker-Vereinigung will be held at Salzburg.

AT the meeting of the London mathematical society held on January 14, 1909, the following papers were read: By H. HILTON, "Canonical form of a linear substitution"; by J. HAMMOND, "On the solutions of the quintic"; by A. CUNNINGHAM, "On octavic and sexadecimic residuacity"; by E. W. HOBSON, "On change of the variable in a Lebesgue integral"; by F. H. JACKSON, "On Abel's extension of Taylor's series"; by H. M. MACDONALD, "Note on the evaluation of a certain integral containing Bessel's functions."

At the meeting of the society held on February 11 the following papers were read: By A. C. DIXON, "On the relation between Pfaff's problem and the calculus of variations"; by W. H. YOUNG, "On implicit functions and their differentials"; by W. H. SALMON, "On a certain family of cubic surfaces"; by E. W. HOBSON, "Some fundamental properties of Lebesgue integrals of a two dimensional domain"; by L. E. DICKSON, "Modular invariants of a general system of linear forms."

THE executive committee of the international commission of secondary instruction in mathematics held its first session at Cologne in September, 1908, and perfected its organization. The principal features are the following:

Each country having at least two delegates at two or more congresses of mathematicians will have one vote in the com-

mission; other countries may send one delegate, who will have no vote. The executive committee is final authority on all questions concerning the commission. The official organ will be *L'Enseignement Mathématique*. The purpose of the commission is to institute an inquiry and to prepare a comprehensive report concerning the aims and methods of mathematical instruction throughout the world. The commission hopes to present its complete report to the fifth international congress, to be held at Cambridge, England, in August, 1912.

THE Spanish association for the advancement of science was organized last year; the first meeting was held at Zaragossa, October 22–29, 1908. Sixteen papers were read in the section of mathematics. Two committees were appointed, one to examine and report on the feasibility of organizing a Spanish mathematical society, the other to study the formation of a Spanish mathematical vocabulary.

THE royal academy of sciences of Turin announces the following programme for the seventeenth award of the Bressa prize. The purpose of the competition is to reward the scientist or inventor, irrespective of affiliation or nationality, who, during the period 1907–1910, has in the judgment of the academy made the most brilliant and useful discovery or who has made the most noteworthy advances in physical or experimental sciences, natural history, pure or applied mathematics, chemistry, physiology or pathology, not excluding geology, history, geography, or statistics.

Competing memoirs should be printed and sent to the president with the statement that they are entered for the competition, which closes December 31, 1910. The net value of the prize is 9300 francs.

THE following courses in mathematics will be offered during the summer semester, 1909.

UNIVERSITY ON GÖTTINGEN. — By Professor F. KLEIN: Mechanics of the continuum, four hours; Seminar, two hours. — By Professor D. HILBERT: Theory of numbers, four hours; Selected problems in the theory of functions, two hours; Seminar, two hours. — By Professor C. RUNGE: Differential equations, four hours; Seminar, two hours. — By Professor W. VOIGT: Thermodynamics, four hours. — By Professor L.

PRANDTL: Theory of aeronautics, four hours. — By Professor A. SCHWARZSCHILD: Advanced celestial mechanics, four hours. — By Professor E. WIECHERT: Theory of potential, four hours. — By Professor E. ZERMELO: Differential and integral calculus, four hours. — By Dr. O. TOEPLITZ: Analytic geometry, four hours. — By Dr. P. KOEBE: Elementary mathematics from a higher standpoint, four hours.

DURING the year 1908 the following doctorates were conferred at the University of Paris with mathematics as the major subject (the titles of the theses are given): T. LALESCU (Bucarest), "Sur l'équation de Volterra"; J. B. ROUSIER (Vienna), "Ondes par émersion"; C. POPOVICI (Jasey, Roumania), "Sur les surfaces intégrales communes aux équations différentielles"; N. ENACHE (Dozesci, Roumania), "Contributions à la théorie de l'écoulement sur les déversions à minces parois et à nappe noyée au dessous"; H. B. HEYWOOD (Peklam, England), "Sur l'équation fonctionnelle de Fredholm et quelques-unes de ses applications."

AT the Vienna meeting of the Astronomische Gesellschaft it was voted to solicit funds for the erection of a Gauss tower on Hohenhagen, the highest mountain near Göttingen, at the vertex of the Brocken-Göttingen-Hohenhagen triangle with which Gauss experimented concerning non-euclidean geometry. Ten thousand Marks have already been received. It is desired that this sum may be sufficiently increased to warrant the laying the corner stone April 30, 1909, the birthday of Gauss. Contributions may be sent to Professor F. Klein, Göttingen, Wilhelm Weberstrasse 3.

THE reproduction of an unpublished photograph of DIRICHLET, superior to any heretofore obtainable, will be issued, provided enough subscriptions are received to defray the expense. The size will be 14 × 18 cm. and the price is two Marks. Orders may be sent to Frl. Lotte Nelson, Darmstadt, Moosbergstrasse 43.

DR. F. RUSL, docent in mathematics at the Bohemian University of Prague, has been appointed associate professor of mathematics at the Bohemian technical school of Prague.

PROFESSOR R. RAU, of the University of Jena, will retire from his university position at the close of the present semester.

PROFESSOR M. DELASSUS, of the University of Besançon, has accepted the professorship of mechanics at the University of Bordeaux.

DR. G. D. BIRKHOFF, of the University of Wisconsin, has accepted an assistant professorship of mathematics at Princeton University.

PROFESSOR OTTO RUPP, of the technical school at Brünn, died in January, at the age of 54 years.

MR. MARTIN SCHILLING, manufacturer of mathematical models and apparatus at Halle, died December 24, 1908, at the age of 42 years.

PROFESSOR E. A. LEGOUX, of the University of Toulouse, died January 6, at the age of 67 years.

PROFESSOR HERMANN MINKOWSKI, of the University of Göttingen, died January 12. He was born at Alexoten, Russia, June 22, 1864, studied at Königsberg and Berlin, held associate professorships of mathematics at Bonn and Königsberg, and was promoted to a full professorship at Königsberg in 1895. The next year he was called to the technical school at Zürich; he accepted the newly established professorship of mathematics at Göttingen in 1903.

RECENT catalogues of second-hand mathematical books: — Bowes and Bowes, 1 Trinity Street, Cambridge, England, catalogue No. 326, later period, about 2600 titles. — A. Hermann, 6 rue de la Sorbonne, Paris, catalogue No. 95, 1900 titles.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

BECKER (J.). Die Riccatische Differentialgleichung. (Progr.) Karlsbad, 1908. 8vo. 25 pp.

BÖRNER (E.). Beweis eines Satzes aus der Gruppentheorie. (Progr.) Wien, 1908. 8vo. 13 pp.

BÜCHER, neue, über Naturwissenschaften und Mathematik. Mitgeteilt Herbst 1908. Leipzig, Hinrich, 8vo. 19 pp. M. 0.30

CZUBER (W.). Einführung in die höhere Mathematik. Leipzig, Teubner, 1909. 8vo. 10 + 382 pp. Cloth. M. 1200.