

NOTES.

THE April number (volume 9, number 2) of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY contains the following papers: "Representations of the general symmetric group as linear groups in finite and infinite fields," by L. E. DICKSON; "Surfaces with isothermal representation of their lines of curvature and their transformations," by L. P. EISENHART; "The equilog transformations of space," by J. L. COOLIDGE; "Concerning linear substitutions of finite period with rational coefficients," by A. RANUM; "On hypercomplex number systems belonging to an arbitrary domain of rationality," by R. B. ALLEN; "On the asymptotic character of the solution of certain linear differential equations containing a parameter," by G. D. BIRKHOFF; "On the holomorph of the cyclic group of order p^m ," by G. A. MILLER; "On non-measurable sets of points," by E. B. VAV VLECK.

THE April number (volume 30, number 2) of the *American Journal of Mathematics* contains: "Concerning systems of conics lying on cubic, quartic, and quintic surfaces," by C. H. SISAM; "On the canonical forms and automorphs of ternary cubic forms," by L. E. DICKSON; "The elliptic cylinder function of class K ," by W. H. BUTTS; "On elliptic modular equations for transformations of orders 29, 31, 37," by A. BERRY; "On translation surfaces connected with a unicursal quartic," by J. EIESLAND.

AT the meeting of the London mathematical society held on March 12 the following papers were read: By E. B. ELLIOTT, "On the projective geometry of some covariants of a binary quintic"; by W. H. YOUNG, "On the inequalities connecting the double and repeated upper and lower integrals of a function of two variables"; by W. F. SHEPPARD, "On the operational expression of Taylor's theorem"; by H. A. P. DE S. PITTARD, "A proof of a theorem of Fermat's"; by M. J. M. HILL, "On a formula for the sum of a finite number of terms of the hypergeometric series, whose fourth element is unity."

THE summer meeting of the American association for the advancement of science will be held at Dartmouth College, Hanover, N. H., during the week beginning June 29.

THE tenth regular meeting of the association of teachers of mathematics in the Middle States and Maryland was held at the Woman's College, Baltimore, March 14. The following papers were read: By L. S. HULBERT, "Undergraduate instruction in mathematics"; by I. J. SCHWATT, "Our duty as teachers"; by W. H. JACKSON, "Notes on the teaching of mathematics in English preparatory schools and colleges"; by F. MORLEY, "A test of elementary text books in geometry"; by A. J. GMINDER, "The history of mathematical symbolism."

THE Manchester mathematical society was organized at Manchester, England, February 19, 1908, with an initial membership of 60. Professor H. LAMB was elected president, and Mr. H. BATEMAN secretary. Meetings will be held bimonthly. For the present the society will not undertake the publication of its proceedings.

THE following courses in mathematics are announced by German universities for the summer semester of 1908.

UNIVERSITY OF BERLIN. — By Professor H. A. SCHWARZ: On space curves and curved surfaces, four hours; Calculus of variations, four hours; Applications of elliptic functions, two hours; Seminar, two hours; Colloquium, two hours. — By Professor G. FROBENIUS: Theory of determinants, four hours; Seminar, two hours. — By Professor F. SCHOTTKY: Elementary analysis, four hours; Theory of abelian functions, four hours; Seminar, two hours. — By Professor G. HETTNER: Introduction to the theory of ordinary differential equations, two hours. — By Professor J. KNOBLAUCH: Applications of elliptic functions, four hours; Calculus, one hour. — By Professor R. LEHMANN-FILHÈS: Analytic mechanics, four hours. — By Professor E. LANDAU: Differential calculus, four hours; Distribution of prime numbers, four hours. — By Dr. I. SCHUR: Theory of algebraic equations, II, four hours; Analytic geometry, four hours.

UNIVERSITY OF GÖTTINGEN. — By Professor F. KLEIN: Encyclopedia of geometry, four hours; Seminar, two hours. — By Professor D. HILBERT: Principles of mathematics, four hours; Seminar, two hours. — By Professor H. MINKOWSKI: Analytic geometry, four hours; Fourier series and definite integrals, two hours; Seminar, two hours. — By Professor C.

RUNGE: Differential and integral calculus with exercises, six hours; Graphical statics, one hour; Seminar, two hours.—By Professor L. PRANDTL: Theory of elasticity and rigidity, three hours; Introduction to the theory of machines, one hour; Seminar, two hours.—By Professor G. HERGLOTZ: Equilibrium and motion of liquids under gravity, three hours; Selected chapters of celestial mechanics, three hours.—By Professor E. ZERMELO: Mathematical logic, two hours.—By Dr. C. CARATHÉODORY: Functions of real variables, two hours; Historical introduction to the calculus of variations, one hour.—By Dr. P. KOEBE: Elementary differential equations, six hours.—By Dr. O. TOEPLITZ: Introduction to the theory of integral equations, three hours; Proseminar, two hours.—By Professor F. BERNSTEIN: Probabilities, two hours; History of mathematics, two hours.

UNIVERSITY OF LEIPZIG.—By Professor C. NEUMANN: Analytic mechanics, four hours.—By Professor O. HÖLDER: Applications of elliptic functions, three hours; Elliptic modular functions, three hours; Seminar, two hours.—By Professor F. HAUSDORFF: Differential equations, four hours.—By Professor K. ROHNS: Algebraic curves, four hours; Descriptive geometry, I, two hours.—By Professor H. LIEBMANN: Plane analytic geometry, four hours; Vector analysis with applications, two hours.

THE following advanced courses are announced by the various American universities for the academic year 1908–1909:

CORNELL UNIVERSITY.—By Professor J. MCMAHON: Theory of sound, two hours; Electricity, two hours.—By Professor J. I. HUTCHINSON: Theory of functions of a complex variable, three hours.—By Professor V. SNYDER: Higher geometry, three hours.—By Professor W. B. FITE: Theory of groups, three hours.—By Dr. F. R. SHARPE: Theory of potential and Fourier's series, three hours; Elliptic functions, two hours, first half year.—By Dr. W. B. CARVER: Projective geometry, three hours.—By Dr. A. RANUM: Elementary differential equations, two hours; Higher algebra, two hours.—By Dr. D. C. GILLESPIE: Advanced calculus, three hours; Integral equations, two hours, second half year.—By Dr. C. F. CRAIG: Advanced analytic geometry, three hours;

Partial differential equations, two hours, first half year. — By Dr. F. W. OWENS: Solid analytic geometry, two hours.

The Oliver mathematical club will meet weekly.

INDIANA UNIVERSITY. — By Professor R. J. ALEY: Advanced calculus, three hours (a, w, s); Higher algebra, two hours (a, w); Algebra of quantics, three hours (s). — By Professor S. C. DAVISSON: Ordinary differential equations, three hours (a, w); Functions of a complex variable, three hours (s); Fourier's series and integrals, three hours (a); Modern analytic geometry, two hours (w, s). — By Professor D. A. ROTHROCK: Quaternions, three hours (a); Partial differential equations, three hours (w, s). — By Professor U. S. HANNA: Elliptic integrals and functions, two hours (a, w); Infinite series and products, three hours (s). — By Dr. C. HASEMAN: Mathematical theory of elasticity, three hours (a, w); Theory of potential, three hours (s). [a, w, s above indicate autumn, winter, and spring terms.]

YALE UNIVERSITY. — By Professor J. PIERPONT: Introduction to the theory of functions, two hours; Projective geometry, two hours; Advanced mechanics, two hours; Advanced theory of functions, two hours. — By Professor P. F. SMITH: Advanced analytic geometry, two hours; Continuous groups of transformations, two hours. — By Professor E. W. BROWN: Mechanics, two hours; Advanced calculus, three hours; Celestial mechanics, two hours. — By Professor H. E. HAWKES: Algebra and analytic geometry, two hours; Theory of equations, two hours. — By Professor M. MASON: Linear differential equations, two hours; Calculus of variations, one hour. — By Dr. L. I. HEWES: Differential equations, one hour; Graphical and numerical computation, one hour. — By Dr. W. A. GRANVILLE: Differential geometry, two hours.

THE following advanced summer courses are announced:

UNIVERSITY OF CHICAGO (summer quarter, June 13 to August 28, 1908). — By Professor H. S. WHITE: Theory of elliptic functions, four hours; Higher plane curves, four hours. — By Professor H. E. SLAUGHT: Theory of definite integrals, four hours; Analytic geometry, five hours. — By Professor J. W. A. YOUNG: Differential calculus, five hours; Pedagogy of secondary mathematics, four hours. — By Professor L. E.

DICKSON : Theory of equations, four hours. — By Professor G. A. BLISS : Differential geometry from the Lie standpoint, four hours ; Integral calculus, five hours. — By Dr. A. C. LUNN : Analytic mechanics, four hours ; Higher algebra, five hours.

COLUMBIA UNIVERSITY (summer session, July 7 to August 14). — By Professor JAMES MACLAY : Advanced calculus, five hours. — By Professor W. B. SMITH : Theory of functions of a complex variable, five hours. — By Professor EDWARD KASNER : Differential equations, five hours. — By Dr. G. H. LING : Modern higher algebra, five hours.

INDIANA UNIVERSITY (summer session, June 25 to Sept. 4). — By Professor R. J. ALEY : History of mathematics, three hours ; Ordinary differential equations, four hours. — By Professor S. C. DAVISSON : Advanced integral calculus, five hours ; Theory of surfaces, five hours. — By Professor D. A. ROTHROCK : Solid analytic geometry, three hours.

UNIVERSITY OF PENNSYLVANIA (summer session, July 6 to August 15). — By Professor I. J. SCHWATT : Definite integrals, five hours. — By Professor G. H. HALLETT : Theory of functions of a complex variable, five hours. — By Professor F. H. SAFFORD : Differential equations, five hours.

THE following Smith's prizemen are announced for the year 1908 : W. J. HARRISON (Clare College) for his essay, "Problems in the wave motion of viscous liquids" ; J. E. LITTLEWOOD (Trinity College) for his essay, "On the asymptotic behavior of integral functions of zero order, and allied functions" ; J. MERCER (Trinity College) for his essay, "On the solution of ordinary linear differential equations having doubly periodic coefficients." Five other essays were declared worthy of honorable mention.

THE HON. BERTRAND RUSSELL has been elected a fellow of the Royal society of London.

PROFESSOR P. STÄCKEL, of the technical school at Hanover, has accepted a call as professor of mathematics at the technical school at Karlsruhe.

PROFESSOR V. VOLTERRA, of the University of Rome, has been elected foreign member of the royal academy of sciences of Stockholm.

PROFESSOR H. POINCARÉ, of the University of Paris, has been elected to membership in the French academy, as successor to the late M. SULLY PRUDHOMME. Professor Poincaré has been a member of the academy of sciences since 1887.

THE Institute of France has awarded the Binoux prize (for the history of the sciences) for the current academic year to Professor GINO LORIA, of the University of Genoa.

DR. E. HILB has been appointed docent in mathematics at the University of Erlangen.

AT the University of Nebraska, Professor C. C. ENGBERG has been promoted to a full professorship of applied mathematics, and Professor W. C. Brenke has been promoted to an assistant professorship of mathematics.

MR. B. F. MORRELL has been appointed professor of mathematics at Fort Worth University, Fort Worth, Texas.

AT Harvard University, Dr. J. L. Coolidge has been promoted to an assistant professorship of mathematics.

MR. P. B. TURNER has been appointed tutor in mathematics at the College of the City of New York.

PROFESSOR C. H. ASHTON, of the University of Kansas, has been granted leave of absence for the next academic year, and will study in Munich.

PROFESSOR L. LINDELÖF, of the University of Helsingfors, died March 3, at the age of 70 years.

DR. M. P. H. LAURENT, examiner in mathematics at the Ecole polytechnique of Paris, died March 2, at the age of 67 years.

PROFESSOR L. WEDEKIND, of the technical school at Karlsruhe, died February 8, at the age of 69 years.

PROFESSOR A. E. V. BRAUNMÜHL, of the technical school at Munich, died March 11, at the age of 55 years.