

NOTES.

THE Seventh Summer Meeting of the AMERICAN MATHEMATICAL SOCIETY will be held, in affiliation with the American association for the advancement of science, at Columbia University, New York City, beginning Wednesday, June 27th, 1900, and extending through three or more days. Papers intended for presentation at this meeting should be in the hands of the Secretary by June 7th.

THE preliminary programme of the International congress of philosophy, to be held at Paris, August 2d-7th, has appeared. The following subjects from the section of logic and history of the sciences are of interest to mathematicians:—1° Algebra of logic and theory of probabilities; theories of ensembles, sequences, and groups; the transfinite. 2° Principles of analysis: number, continuity, theory of functions, 3° The postulates of geometry, their origin and value; intuition in mathematics; non-euclidean geometries. 4° Methods of geometry; analytical geometry; projective geometry; geometrical calculus. 5° Principles of mechanics, their nature and value. 6° Methods of mathematical physics; theory of errors and approximation. 7° The origins of the infinitesimal calculus. 8° The genesis of the notion of imaginary and the progressive elucidation of the theory of functions. 9° History of the discovery of the Newtonian gravitation, and of its influence upon the development of mechanics and physics.

THE following papers were presented at the regular meeting of the Edinburgh mathematical society on February 9th: "Remark on Dr. Peddie's proof of a theorem in potential," by Mr. R. F. MUIRHEAD; "A general mechanical description of the conic sections," by Mr. ALEXANDER MORRISON; "On Bessel functions and spherical harmonics," by Mr. JOHN DOUGALL.

AT a meeting of the Cambridge philosophical society on February 5th, Dr. A. C. DIXON presented a paper "On differential equations with two independent variables."

THE programme of the meeting of the Texas academy of science, held February 16th, included a paper by Professor L. E. DICKSON, of the University of Texas, entitled "An elementary account of the greater problems solved by the modern group theory."

THE eighth volume (1900) of the *Jahresbericht* of the German mathematical association will consist of three parts. The first will contain an account of the annual meeting held at Munich, September 17-22, 1899, the constitution and by-laws of the association, a list of its four hundred and forty members, and appreciative biographical notices accompanied by portraits of six of its members deceased during the year 1899: C. I. GERHARDT, by M. Cantor; SOPHUS LIE, by Friedrich Engel; EUGEN VON LOMMEL, by Ludwig Boltzmann; FRIEDRICH MEYER, by G. Riehm; HERMANN SCHAPIRA, by C. Koehler; KARL SCHOBER, by W. Wirtinger. The second part of the volume will contain the papers presented at the Munich meeting (see BULLETIN, current volume, pp. 33-34). The third will contain three extensive reports: "The analytico-arithmetical theory of algebraic functions of two variables," by K. HENSEL; "The kinetic problems of scientific technology," by K. HUEN; "Curve and point manifoldnesses," by A. SCHOENFLIES.

BEGINNING with the January number of this year the *Nouvelles Annales de Mathématiques* inaugurates a monthly supplement containing features quite analogous to the "Notes" and the "New Publications" of the BULLETIN. This supplement consists of a chronicle of general mathematical intelligence, a bibliographical bulletin of recent periodicals and recent works, and a petite correspondance. The *Bolletino di Bibliografia e Storia delle Scienze Matematiche*, *L'Enseignement Mathématique*, and the *Bibliotheca Mathematica* have also recently promised to give their readers mathematical news. The *Nouvelles Annales* proposes occasionally to include portraits accompanied by brief biographical sketches; Lagrange is the first of the series.

IN the future the *Mathematical Gazette* of the British mathematical association will be issued six instead of three times per year. The aim of the association in publishing the *Gazette* is to supply a journal of direct and special interest to teachers of mathematics. Among the special features announced are articles suggestive of improvements in methods of teaching, others on subjects not satisfactorily treated in the textbooks, reviews of books of the first importance and of groups of textbooks on kindred subjects giving elementary presentations of the history and treatment of the subject. The second volume which begins with the present year will contain a series of articles by Professor CHARLOTTE ANGAS SCOTT, on von Staudt's *Geometrie der Lage*.

THE lectures on differential equations delivered by Professor É. PICARD at the decennial of Clark University in July, 1899, are appearing in the *Revue Générale des Sciences*.

MESSRS. Deighton Bell and Company, of Cambridge, England, now offer the second edition of Cayley's Elliptic functions at seven and a half shillings.

MESSRS. D. Appleton and Company, of New York, have recently published Elements of the differential and integral calculus based on the Lehrbuch der Differential- und Integral-Rechnung of Professors W. Nernst and A. Schoenflies, by Professor J. W. A. YOUNG, of the University of Chicago, and Mr. C. E. LINEBARGER, of the Lake View high school, Chicago.

THE proposed changes in the examinations for the mathematical tripos at Cambridge University, abolishing the order of merit and the senior wrangler, were defeated in the senate of the university, February 15th, by a vote of one hundred and fifty-two to one hundred and thirty-nine.

CORNELL UNIVERSITY. Among the courses announced for the summer session, July 5th to August 16th, are courses in algebra, geometry, trigonometry, analytical geometry, and infinitesimal calculus, given by Professor WAIT and Drs. MURRAY and MILLER, and the following advanced courses:—By Professor L. A. WAIT: Analytic geometry, based on Salmon's conic sections, three hours; Differential calculus, based on the treatises of Todhunter and Williamson, three hours; Integral calculus, three hours.—By Dr. D. A. MURRAY: Differential equations covering parts of the author's textbook, three hours.—By Dr. G. A. MILLER: Projective geometry, an elementary course in Cremona's projective geometry, three hours; Theory of functions of a complex variable, the elements of the theories of Cauchy, Riemann, and Weierstrass, three hours; Introduction to the theory of groups and theory of numbers, three hours; seminar in groups, two hours.

DURING the summer semester of 1900 the several universities mentioned below offer the following courses in mathematics, the lectures beginning about April 20th and closing about July 31st:

UNIVERSITY OF ERLANGEN. By Professor P. GORDAN: Differential equations, four hours; Invariants, four hours; Exercises in seminar, three hours.—By Professor M. NOETHER: Synthetic geometry with exercises, four hours; Analytical mechanics, four hours; Mathematical exercises.

UNIVERSITY OF GÖTTINGEN. By Professor G. BOHLMANN : Analytical geometry, four hours.—By Professor F. SCHILLING : Differential calculus, four hours; Axonometry and perspective, one hour; Exercises in seminar, two hours.—By Professor D. HILBERT : Theory of differential equations, four hours; Selected chapters from the theory of surfaces, two hours; Exercises in seminar.—By Professor F. KLEIN : Theory of elasticity, four hours; Exercises in seminar, two hours.—By Dr. E. ZERMELO : Elliptic functions, two hours.—By Dr. J. SOMMER : Theory of algebraic curves, four hours.

UNIVERSITY OF HEIDELBERG. By Professor L. KOENIGSBERGER : Differential and integral calculus, four hours; Theory of lines and surfaces, four hours; Mathematical seminars, two hours.—By Professor M. CANTOR : Analytical geometry of the plane, four hours; Arithmetic and algebra, three hours.—By Professor F. EISENLOHR : Theory of probabilities, three hours; Mechanics, four hours.—By Professor K. KOEHLER : Synthetic geometry of the plane, three hours.—By Professor G. LANDSBERG : Theory of functions, three hours; Theory of determinants, two hours.

UNIVERSITY OF KIEL. By Professor L. POCHHAMMER : Analytical geometry of space, four hours; On differential equations in one independent variable, four hours; Exercises in mathematical seminar, one hour.—By Professor P. STÄCKEL : Higher analysis, first part, four hours; Projective geometry, two hours; Partial differential equations, three hours; Exercises in mathematical seminar, one hour.

UNIVERSITY OF MUNICH. By Professor G. BAUER : Analytical geometry of space; Exercises to the preceding course; Mathematical seminar.—By Professor F. LINDEMANN : Integral calculus; Theory of conformal representation and linear differential equations; The fundamental concepts of geometry; Mathematical seminar in the resolution of higher equations.—By Professor A. PRINGSHEIM : Selected chapters from the theory of functions; Definite integrals.—By Dr. H. BRUNN : Elements of higher mathematics for general students.—By Dr. K. DÖHLEMANN : Descriptive geometry, with exercises; Geometric transformations.—By Dr. E. RITTER VON WEBER : Ordinary differential equations; Elements of geometry.—By Dr. A. KORN : Analytical mechanics; Selected chapters in potential theory.—By Dr. GÖTTLER : General theory of algebraic curves; Methodology and pedagogy of mathematical instruction in secondary schools.

UNIVERSITY OF TÜBINGEN. By Professor H. STAHL: Elementary analysis, three hours; Theory of functions, three hours; Seminar, two hours.—By Professor A. VON BRILL: History of the theory of algebraic functions, two hours; Analytical mechanics, five hours; Seminar, two hours.—By Professor L. MAURER: Higher analysis, two hours; Exercises to the preceding course, one hour; Potential theory, two hours.

AT the meeting of the Deutsche Mathematiker-Vereinigung, last September, Professor HILBERT sketched briefly a new method for establishing existence theorems in the case of boundary value problems, and gave two applications of the method—one, to the proof that, on a given surface, a shortest line exists connecting two points, the other, to supplying the final step in 'Dirichlet's Principle,' as employed by Riemann in his dissertation. In the latter case, Professor Hilbert gives a direct proof that a function exists satisfying the boundary conditions and rendering the double integral

$$\iint \left\{ \left(\frac{\partial f}{\partial x} \right)^2 + \left(\frac{\partial f}{\partial y} \right)^2 \right\} d\sigma$$

a minimum. (Cf. the forthcoming *Jahresbericht der Deutschen Mathematiker-Vereinigung*.) The method promises to admit of wide application to the boundary value problems of mathematical physics and geometry. In the coming summer semester at Göttingen, Professor Hilbert intends to give a course in which the essential features of the method, together with some of its applications, will be treated in detail.

PROFESSOR SIMON NEWCOMB has been elected correspondent of the Bureau des Longitudes of Paris.

PROFESSORS H. G. ZEUTHEN, of Copenhagen, and G. MITTAG LEFFLER, of Stockholm, have been elected correspondents to the section of geometry of the Paris academy of sciences, the former in place of the late Sophus Lie.

PROFESSOR A. GUTZMER, of the University of Jena, has been made professor ordinarius at the same institution.

DR. L. RAFFY, maître de conférences of the faculty of sciences of the University of Paris has been promoted to an adjunct professorship of mathematics.

MR. ALBERT M. SAWIN has been made instructor in mathematics at Syracuse University.

The deaths are announced of DR. HERRMAN SCHAEFFER, honorary professor of mathematics at the University of Jena, of Professor CHARLES PIAZZI SMITH, the astronomer, and of Mr. LEANDER J. McCORMICK, founder of the observatory bearing his name at the University of Virginia.

Two errors in noticing appointments have occurred in recent numbers of the BULLETIN. Dr. H. LIEBMANN has become privat docent at Leipzig, not Königsberg, and Mr. F. E. ROSS has been appointed instructor at the University of Nevada, not Nebraska.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

- CANTOR (M.). Vorlesungen über Geschichte der Mathematik. Vol. 2, zweiter Halbband: 1550-1668. 2te Auflage. Leipzig, Teubner, 1899. 8vo. 12 pp. and pp. 481-943. M. 12.00
- FREDHOLM (I.). Sur une équation aux dérivées partielles du quatrième ordre. (*Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar*, Stockholm, 1899.) 8vo. Pp. 935-940.
- FUHRMANN (W.). Beiträge zur Transformation algebraisch-trigonometrischer Funktionen. Teil II. Königsberg, 1899. 4to. 30 pp. M. 1.50
- GERLACH (R.). Die Metrik in projektiven Koordinaten. (Diss.) Zürich, 1899. 8vo. 114 pp.
- LING (G. H.) and MILLER (G. A.). Proof that there is no simple group whose order lies between 1092 and 2001. (*American Journal of Mathematics*, Vol. 22, pp. 13-26.) 4to.
- MILLER (G. A.). Note on Netto's Theory of substitutions. (*Annals of Mathematics*, 2d series, Vol. 1, pp. 71-73.) 4to.
- OTTI (H.). Eigenschaften der Besselschen Funktionen zweiter Art. (Diss.) Bern, 1899. 8vo. 55 pp.
- ROTHROCK (D. A.). Invariants of the finite continuous groups of the plane. (Diss.) Leipzig, 1899. 8vo. 31 pp.
- STENDER (H.). Invariante Flächen und Kurven bei konformen Gruppen des Raumes. (Diss.) Leipzig, 1899. 8vo. 59 pp.

II. ELEMENTARY MATHEMATICS.

- ADAM (V.). Taschenbuch der Logarithmen. 28ste Auflage. Wien, 1899. 12mo. 9 + 99 pp. Cloth. M. 1.00
- ANDRE (P.). Nouveau cours de géométrie à l'usage de tous les établissements d'instruction, contenant plus de onze cents problèmes résolus et à résoudre, trois traités complets (levé des plans, arpentage, partage des terres), des notions de nivellement et un grand nombre de questions usuelles. 24e édition. Paris, André, 1900. 18mo. 7 + 497 pp.