

NOTES.

THE first number has just appeared of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY, published by the Society with the coöperation of Harvard University, Yale University, Princeton University, Columbia University, Haverford College, Northwestern University, Cornell University, The University of California, Bryn Mawr College, The University of Chicago; edited by ELIAKIM HASTINGS MOORE, ERNEST WILLIAM BROWN, THOMAS SCOTT FISKE; New York, The Macmillan Company. The first number, which consists of 96 pages, contains the following articles: —“Conics and cubics connected with a plane cubic by certain covariant relations,” by H. S. WHITE; “Formentheoretische Entwickelung der in Herrn White’s Abhandlung über Curven dritter Ordnung enthaltenen Sätze,” by P. GORDAN; “Sur la définition générale des fonctions analytiques, d’après Cauchy,” by E. GOURSAT; “On a class of particular solutions of the problem of four bodies,” by F. R. MOULTON; “Definition of the abelian, the two hypoabelian, and related linear groups as quotient groups of the groups of isomorphisms of certain elementary groups,” by L. E. DICKSON; “Note on the unilateral surface of Moebius,” by H. MASCHKE; “On regular singular points of linear differential equations of the second order whose coefficients are not necessarily analytic,” by M. BÔCHER; “The elliptic sigma functions considered as a special case of the hyperelliptic sigma functions,” by O. BOLZA; “On the groups which are the direct products of two subgroups,” by G. A. MILLER; “On certain crinkly curves,” by E. H. MOORE; “A new definition of the general abelian linear group,” by L. E. DICKSON.

A NEW Annual Register of the AMERICAN MATHEMATICAL SOCIETY, including a list of members, directory, list of publications, constitution, by-laws, and the reports of the Treasurer and Librarian has recently been published and distributed to the members of the Society. Copies of the Register may be obtained from the Secretary.

At the third ordinary meeting of the eighteenth session of the Edinburgh mathematical society, January 12, 1900, an address was delivered by Dr. PEDDIE on “The dissipation of energy in vibrating matter.” Professor GIBSON’S recent papers on the theory of proportion will be published in full in the society’s *Proceedings*.

THE Circolo matematico di Palermo elected the following council for the years 1900–1902 at its recent annual meeting:—Resident members, Professors M. L. Albeggiani, M. Gebbia, F. Gerbaldi, G. B. Guccia, G. Torelli; Non-resident members: Professors E. Beltrami, of Rome, L. Bianchi, of Pisa, A. Capelli, of Naples, V. Cerruti, of Rome, L. Cremona, of Rome, P. Del Pezzo, of Naples, A. Del Re, of Naples, G. Loria, of Genoa, G. Mittag-Leffler, of Stockholm, E. Pascal, of Pavia, G. Peano, of Turin, S. Pincherle, of Bologna, H. Poincaré, of Paris, A. Tonelli, of Rome, V. Volterra, of Turin.

THE following papers were announced for the regular monthly meeting of the London mathematical society held January 11, 1900:—“A problem in resonance, illustrative of the mechanical theory of selective absorption,” by Professor H. LAMB, and “Elementary distributions of plane stress,” by Mr. J. H. MICHELL.

At the preceding meeting of December 14, 1899, the list of papers presented was as follows:—“A method for extending the accuracy of mathematical formulæ,” and “Central difference formulæ,” by Mr. W. F. SHEPPARD; “Circular cubics,” by Mr. A. B. BASSETT; “The theorem of residuation, being a general treatment of the intersections of plane curves at multiple points,” by Dr. F. S. MACAULAY; “The genesis of the double gamma functions,” by Mr. E. W. BARNES; “On the expression of spherical harmonics as fractional differential coefficients,” by Mr. J. ROSE-INNES; “Sums of greatest integers,” by Dr. G. B. MATHEWS.

At the meeting of the Royal Society of Edinburgh on December 19, 1899, Professor TAIT presented a “Note on the claim recently made for Gauss to the invention of quaternions,” whose object was to show that what Professors Klein and Sommerfeld ascribed to Gauss in their treatise *Ueber die Theorie des Kreisels* was not the Hamiltonian quaternion, but a particular and limited kind of strain which consisted of a simple rotation combined with an isotropic expansion, and thus involving four constants only. Dr. C. G. KNOTT contributed a detailed criticism of the section devoted to the discussion of the theory of quaternions in the treatise cited.

THE annual meeting of the British mathematical association was held January 20, 1900, and the following papers were presented:—“Dynamical applications of the theory of correspondences,” by Professor R. S. BALL; “Triangles

triply in perspective," by Mr. J. A. THIRD; "The teaching of indices and surds," by Professor R. W. GENESE; "Illustrations of prismatic equations," by Mr. T. J. BROMWICH; "A note on the focoids," by Mr R. F. DAVIS.

ON the twenty-fourth of December, 1899, the Physico-mathematical society of Kazan celebrated a jubilee in honor of the twenty-fifth year of the scientific career of Professor VASILIEV, who has been president of the society for fifteen years.

AMONG the various congresses in process of organization in connection with the approaching Paris Exposition there is to be one devoted to the history of the sciences. This congress proposes to consider the development of all branches of scientific knowledge. Professor PAUL TANNERY is president, and Dr. SICARD DE PLAULOLES is secretary of the organizing committee. The official address of this committee is 10 boulevard Raspail, Paris.

THE last volume of the *Revue de Métaphysique et de Morale* contains an extended discussion on the axioms of geometry between Professor H. POINCARÉ and Mr. B. RUSSELL, occasioned by the essay of the latter on the foundations of geometry. The discussion is continued in the January number of the current volume. In this connection it may be added that Mr. FREDERICK PURSER contributes an elaborate defense of the Kantian theory of the axioms of geometry to the twenty-fifth number of *Hermathena*, edited by members of Trinity College, Dublin.

AS ONE of the by-products of the Encyclopædia of the mathematical sciences now in process of construction, Teubner, of Leipzig, announces the preparation of an elaborate series of text-books in the field of pure and applied mathematics, and seeks the coöperation of mathematicians in the project, whether or not they be members of the contributing staff of the Encyclopædia. The preliminary announcement is very meagre, but more precise details are promised at an early date. The following members of the editorial staff of the Encyclopædia; among others, have signified their approval of the undertaking:—Messrs. Bôcher, Brunel, Castelnovo, Dingeldey, Enriques, Harkness, Kohn, Krazer, von Lilienthal, Mehmké, Netto, Pincherle, Segre, Seliwanoff, Simon, Stäckel, Staude, Vahlen, Voss, Wiman, Wirtinger, and Zeuthen.

PROFESSOR V. BJERKNES, of the University of Stockholm, has just issued the first volume of his "Vorlesungen über

hydrodynamische Fernkräfte nach C. A. Bjerknæs' Theorie." This volume, illustrated with forty figures, gives an exposition, together with the author's original contributions, of the theories which have constituted the life work of his father Professor C. A. Bjerknæs of the University of Christiania, and experiments which have brought to light the analogies between electrostatic and electrodynamic phenomena and the apparent attractions experienced by solid bodies plunged into moving liquids.

THE approaching volume of the *Jahresberichte* of the German mathematical association will contain, among others, the following memoirs:—"Numerical solution of equations," by R. HAUSSNER; "The kinetic problems of scientific technology," by K. HEUN; "Calculus of variations," by A. KNESER; "Graphic methods," by R. MEHMKE; "The theory of manifoldnesses," by A. SCHOENFLIES; "General dynamics," by PAUL STÄCKEL; "The theory of finite groups," by E. STEINITZ.

THE first volume of a French edition of TCHEBYCHEV'S collected works has just appeared. The volume, which is edited by Professors MARKOF and SONINE, contains thirty-four memoirs and a portrait of their author. A German translation of Vasseliev's memoir on the mathematical work of Tchebychef is to be published immediately by Teubner, of Leipzig.

M. HERMANN, of Paris, announces the appearance of a memoir of Professor G. HUMBERT on singular abelian functions.

PORTRAITS of the following mathematicians are to be had of B. G. Teubner, of Leipzig:—Moritz Cantor, Alfred Clebsch, Hermann Grassmann, Hermann von Helmholtz, Leopold Kronecker, Sophus Lie, Nikolaj Lobatschefskij, and P. L. Tchebychef. With the exception of that of Grassmann, which is a woodcut, all are heliogravures.

THE Brussels academy of sciences has awarded its prize of six hundred francs to Professor LÉON AUTONNE, of the University of Lyons, for his work in geometry.

PARIS ACADEMY OF SCIENCES.—Professor CHARLES MÉRAY, of Dijon, has been elected a correspondent of the section of geometry.—The nominees of the academy for the post of astronomer at the Bureau des Longitudes held by the late Professor Tisserand are MM. RADAU and BIGOURDAN.—The

Bordin prize in geometry was not awarded but M. JULES DRACH received an honorable mention. This was to have been awarded in 1898 for a successful memoir on a study of questions relative to the determination as to properties and applications of systems of orthogonal curvilinear coördinates in n variables, indicating in particular and in a manner as precise as possible the degree of generality of these systems. But one memoir, of insufficient merit, was received in 1898; accordingly the competition was held open for 1899. Three new memoirs were received by the academy, only one of which was retained. This bore the unique device "L'esprit ne peut se soumettre qu' à ce qui est esprit." The commission consisted of Professors Poincaré, Picard, Darboux, M. Lévy, and Appell.—The Francoeur prize in geometry was awarded to M. LE CORDIER, with a very honorable mention to M. LE ROY.—The Poncelet prize was given to M. COSSERAT for the whole of his contributions to geometry and mechanics.—The extraordinary prize in mechanics, six thousand francs, was assigned to M. BAILLES for his treatise on the geometry of indicator diagrams, supplementary prizes being given to MM. CHARBONNIER, GALY-ACHÉ and PERRIN.—The Montyon prize was awarded to M. PARTIOT, the PLUMÉY prize to M. BONJOUR, and the Fourneyron prize to M. A. RATEAU.—The Lalande prize in astronomy was awarded to Mr. W. R. BROOKS for his discoveries in connection with comets, and the Valz prize to M. NYRÉN, of Pulkowa, for his work in sidereal astronomy.—Of the general prizes, the Arago medal was conferred on Professor G. G. STOKES on the occasion of his jubilee at Cambridge, and the Petit D'Ormy prize in mathematics was given to M. MOUTARD.—In 1900 the subject for the Grand Prize in the mathematical sciences is "to perfect in some important point the investigation of the number of classes of quadratic forms having integral coefficients in two indeterminates." The subject of the Bordin prize for the same year is "to develop and perfect the theory of surfaces applicable on a surface of revolution." The Francoeur, Poncelet, Montyon, Lalande, and Valz prizes will be awarded the same year. The *Comptes rendus* for December 18, 1899, contains full details relative to all the prizes of the academy.

UNIVERSITY OF CALIFORNIA.—The following courses in mathematics are announced for the second term of the present session:—By Professor M. W. HASKELL: Selected topics in higher mathematics, two hours; Theory of algebraic forms, three hours; Spherical harmonics, two hours; Seminar, three hours.—By Professor G. C. EDWARDS: Differential

equations, three hours.—By Mr. A. B. PIERCE: Analytical projective geometry, three hours.—By Dr. E. J. WILCZYNSKI: The hypergeometric function, two hours; Calculus of variations, one hour.—By Mr. A. W. WHITNEY: Theory of functions of a complex variable, three hours.—By Mr. N. L. PERRY: Determinants and theory of equations, two hours.

THE department of mathematics of the University of Pennsylvania announces a course of twelve lectures on space analysis to be given by Dr. ALEXANDER MACFARLANE during the month of February, 1900.

PHYSICS was the most favored subject, and mixed mathematics rather more popular than pure mathematics, with the successful candidates for the B.Sc. degree at the recent examinations of London University.

THE public discussion of the proposal to remodel the mathematical tripos at Cambridge University (see BULLETIN, 2d series, vol. 6, No. 4, January, 1900, p. 168) was, on the whole, favorable to the scheme; though the senior wrangler naturally found more than one advocate for his continued existence. Generally speaking, the younger mathematicians, many of whom had themselves headed the tripos, were urgent that the present system is prejudicial to sound mathematical learning, and, in particular, to mathematical research. The older members of the university and certain of the private tutors, while more or less willingly admitting that the system produced imperfect results, denied that the abolition of the order of merit was the proper remedy. They would prefer to see older and more experienced examiners appointed, together with some rearrangement of the marks assigned to the harder questions, without indicating precisely how these suggestions would meet the difficulties of the case. The question is exciting keen discussion in private, inasmuch as the title of senior wrangler is interwoven with the texture of Cambridge tradition. As regards titles it has been suggested that the first Smith's prizeman might bear the title of first wrangler; this would have the advantage of finality, since there is no further examination to displace the candidate. The question comes up for decision in the next Cambridge term.

THE Council of the Royal astronomical society has awarded the society's gold medal of the year 1899 to Professor H. POINCARÉ for his researches in celestial mechanics.

PROFESSORS G. DARBOUX and H. MOISSAN are the delegates of the Paris academy of sciences to the approaching

celebration of the second centenary of the Berlin academy of sciences.

PROFESSOR G. G. STOKES, of Cambridge University, has been elected a foreign associate of the section of mathematics and physics of the Brussels academy of sciences.

PROFESSOR W. BURNSIDE has been made an honorary fellow of Pembroke College, of Cambridge University.

MR. B. H. CRENSHAW has been promoted to an assistant professorship of mathematics at the Alabama Polytechnic Institute.

MR. N. L. PERRY has been appointed instructor in mathematics at the University of California. Dr. J. V. WESTFALL and Mr. AUGUST VON ENDE have been made instructors in mathematics at the University of Iowa. Mr. F. E. ROSS, graduate student of mathematics at the University of California, has been appointed instructor in mathematics at the University of Nebraska.

DR. JOHN EUGENE DAVIES, professor of mathematical physics in the University of Wisconsin, died at Chicago, January 23, 1900.

THE deaths are announced of Mr. FRANCIS GUTHRIE, professor of mathematics in South African College, aged sixty-eight years, and of Judge J. B. STALLO, of Cincinnati, Ohio, a well known patron of philosophy and mathematics, aged seventy-six years.