

ERRATA.

The attention of the editors has been called to the following errata occurring in the present volume of the BULLETIN :

Page 134. The sentence beginning at the foot of the page requires an obvious modification for the case where N is of the form $4k + 1$.

Page 183, line 22, at the end, for (13) (24) read : (13), (24).

Page 238, lines 38 and 40, for $u = gt$, $a \cdot b$, and $a \times b$ read : $v = gt$, $a \cdot b$, and $a \times b$.

Page 259, line 22, for $f(x)$ read : the coefficients of $f(x)$.

NOTES.

THE fifth regular meeting of the San Francisco Section of the AMERICAN MATHEMATICAL SOCIETY will be held at Stanford University on Saturday, April 30, 1904. Titles and abstracts of papers to be presented at this meeting should be in the hands of the Secretary of the Section, Professor G. A. MILLER, Stanford University, not later than April 16.

THE April number (volume 5, number 2) of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY contains the following papers : "An existence theorem for a differential equation of the second order, with an application to the calculus of variations," by G. A. BLISS ; "Determination of all the subgroups of the known simple group of order 25920," by L. E. DICKSON ; "On the invariants of quadratic differential forms, II," by C. N. HASKINS ; "On the coefficients in the product of an alternant and a symmetric function," by E. D. ROE, JR. ; "The groups of order p^3q^2 ," by F. N. COLE ; "Green's theorem and Green's functions for certain systems of differential equations," by C. M. MASON ; "Studies in the general theory of ruled surfaces," by E. J. WILCZYNSKI.

THE January number (volume 5, number 2) of the *Annals of Mathematics* contains the following papers : "Note on a series of analytic functions," by C. ARZELÀ ; "Graphs of the functions Π and Ψ ," by E. P. R. DUVAL ; "Examples of non-applicable surfaces having the same gaussian curvature at corresponding points," by A. S. GALE ; "The mathematical theory

of the top, II," by A. G. GREENHILL; "A relation between the circular and the projective transformations of the plane," by EDWARD KASNER.

The delay in the appearance of the number, for which the editors desire to express their regret, has been due to labor conditions.

AT the meeting of the London mathematical society held on February 11, 1904, the following papers were read: By MR. G. H. HARDY, "On the roots of the equation $1/(x+1)! = c$ "; by Professor A. C. DIXON, "On a certain double integral"; by Professor A. W. CONWAY, "On an appropriate form of conductor for a moving point singularity"; by Professor H. LAMB, "On group velocity"; by Dr. E. W. HOBSON, "On point-wise discontinuous functions of a real variable"; by Mr. G. H. HARDY, "Some extensions of Abel's theorem on power series on the circle of convergence."

THE second international congress of philosophy will be held at Geneva, Switzerland, September 4-8, 1904. The international congress of the history of sciences has been incorporated into the congress of philosophy as a section. Professors D. E. SMITH and F. CAJORI are the American members of the international commission of the congress.

THE French association for the advancement of science will hold its next meeting on August 4, 1904, at Grenoble, under the presidency of C. A. LAISANT.

THE general division of the Technical high school in Munich announces the following prize problem for the present year:

"The representation of plane curves by means of their intrinsic equations has recently received considerable attention. Professor G. SCHEFFERS has defined as intrinsic equations of a surface those which express a relation between the derivatives of the principle radii of curvature with respect to the arcs of the corresponding lines of curvature and the radii themselves. The explicit derivation of these equations for the general quadric surface is desired, and the deduction from them of the principal characteristics of the surfaces."

Competing memoirs must be in the hands of the secretary by October 15, 1904.

AN English translation of Goursat's *Cours d'analyse mathématique* is being prepared by Professor E. R. HEDRICK, with

the assistance of the author and Professor W. F. OSGOOD. While following the French text, the English translation will include a complete revision of the whole work. It will be published in a few weeks by Ginn and Co.

THE universities below offer advanced mathematical courses during the summer session of 1904, as follows :

CORNELL UNIVERSITY. — By Professor L. A. WAIT : Advanced analytic geometry, three hours ; calculus, two hours. — By Professor G. W. JONES : Higher algebra, five hours. — By Professor J. I. HUTCHINSON : Integral calculus, two hours ; theory of functions of a complex variable, three hours. — By Dr. W. B. FITE : Differential equations, five hours ; Number theory, two hours ; Theory of groups, three hours.

UNIVERSITY OF PENNSYLVANIA. — By Professor E. S. CRAWLEY : Modern analytic geometry. — By Professor G. E. FISHER : Theory of functions of a complex variable. — By Professor I. J. SCHWATT : Theory of functions of a real variable. — By Dr. F. H. SAFFORD : Differential equations.

THE several institutions below offer during the second semester of the present academic year courses in mathematics as follows :

COLLÈGE DE FRANCE. — By Professor C. JORDAN : Construction of solvable groups, two hours. — By Professor J. HADAMARD : Equations of elasticity, two hours. — By Professor C. BAIRE : Relation between the ideas of continuity and discontinuity in certain questions of analysis, three hours.

UNIVERSITY OF HALLE. — By Professor G. CANTOR : Theory of numbers, five hours ; Seminar, two hours. — By Professor A. WANGERIN : Selected chapters from the theory of potential, one hour ; General theory of twisted curves and surfaces, five hours ; Differential calculus with exercises, five hours ; Seminar, two hours. — By Professor V. EBERHARD : Analytic geometry of the plane and introduction to that of space, four hours ; with exercises, one hour. — By Professor H. GRASSMANN : Analytic mechanics III, three hours ; with exercises, one hour. — By Dr. F. BERNSTEIN : Theory of functions, four hours ; with exercises, one hour.

UNIVERSITY OF JENA. — By Professor A. GUTZMER : Differential calculus, with exercises, five hours ; Calculation of potential, four hours ; Mathematical colloquium, two hours. — By

Professor J. THOMÆ : Elliptic functions, four hours ; Projective geometry, two hours. — By Professor G. FREGE : Analytic geometry, four hours ; with exercises, two hours.

UNIVERSITY OF PARIS. — By Professor G. DARBOUX : Higher geometry, two hours. — By Professor E. GOURSAT : Ordinary and partial differential equations, two hours. — By Professor P. PAINLEVÉ : Rational mechanics II, two hours. — By Professor G. KOENIGS : Principles of elasticity, two hours. — By Professor E. PICARD : Theory of functions of several variables. — By Professor J. BOUSSINESQ : Equilibrium of the elasticity of the sphere. Mathematical conferences will be held as follows : By Professor S. RAFFY : Higher geometry and the calculus. — By Professor P. PUISEUX : Mechanics. — By Professor H. ANDOYER and DR. BLUTEL : General conferences for students of mathematics.

UNIVERSITY OF ROSTOCK : — By Professor O. STAUDE : Analytic mechanics, four hours ; analytic geometry of space, four hours.

DURING the academic year from April 1, 1902 to March 31, 1903, the German universities conferred 27 doctorates in pure and applied mathematics, two successful candidates being Americans.

ON November 29, 1903, occurred the centenary of the birth of CHRISTIAN DOPPLER, the Austrian mathematician and physicist. A memorial tablet was placed upon the house in which he was born, at Salzburg.

PROFESSOR D. RUDEL, of Nürnberg, has been awarded the silver medal of the Bavarian academy of sciences for his investigations in climatology.

PROFESSOR C. NEUMANN, of Leipzig, has been awarded the Maximilian order by the Bavarian government.

PROFESSOR L. KIEPERT, rector of the technical high school in Hanover, has been awarded the order of the red eagle of the third class by the German emperor.

THE Prussian academy of sciences has voted a grant of 250 marks to Professor H. A. SCHWARZ to enable him to prepare a catalogue of the literature of minimal surfaces.

PROFESSOR E. STUDY, of Greifswald, has been appointed professor of mathematics in the University of Bonn, as successor of the late Professor R. LIPSCHITZ.

DR. R. DAUBLEBSKY V. STERNECK has been appointed acting professor of mathematics in the University of Czernowitz.

DR. FR. KREUTZBERG has been appointed professor of applied mathematics in the Royal Academy, at Posen.

PROFESSOR D. E. SMITH has been made a member of the comité de patronage of *L'Enseignement mathématique*, representing with Professor ALEXANDER ZIWET the United States upon that journal.

PROFESSOR L. E. DICKSON has been appointed research assistant of the Carnegie Institution, and will have a year's leave of absence from his duties at the University of Chicago.

DR. C. N. HASKINS, instructor in mathematics in the Sheffield Scientific School of Yale University, has resigned his position on account of poor health.

MR. J. F. TRAVIS has been appointed instructor in mathematics in the Iowa State College, at Ames, Iowa.

Professor WILHELM SCHELL died at Karlsruhe, Baden, on the thirteenth of February, 1904. His principal scientific work is the well-known treatise on mechanics which under the title "Theorie der Bewegung und der Kräfte" (Leipzig, Teubner) first appeared in 1870 in a single volume and was enlarged to two volumes in 1879-80. This work, which owing to its extensive and accurate bibliographical indications forms a most valuable book of reference, is especially noteworthy for the stress laid upon geometric methods and the attempt to apply to mechanics certain ideas of synthetic geometry. Professor Schell is also the author of a valuable work on twisted curves, "Allgemeine Theorie der Curven doppelter Krümmung in rein geometrischer Darstellung" (Leipzig, Teubner 1859, enlarged 1898), and of several articles published in the *Zeitschrift für Mathematik und Physik*.