There are two appendices, one containing explanatory notes regarding certain theorems on sets of points which are involved in the treatment in the text and the other a short bibliography of recent papers by Young, Baire, Lebesgue, and others. Only twenty-five titles are given.

N. J. LENNES.

NOTES.

THE Eighteenth Summer Meeting of the AMERICAN MATHE-MATICAL SOCIETY will be held at Vassar College on Tuesday and Wednesday, September 12–13. Titles and abstracts of papers intended for presentation at this meeting should be in the hands of the Secretary by Saturday, August 26.

THE April number (volume 12, number 3) of the *Annals of Mathematics* contains the following papers : "On the solutions of ordinary linear homogeneous differential equations of the third order," by G. D. BIRKHOFF ; "Approximate representation," by W. E. BYERLY ; "Note on cubic equations and congruences," by L. E. DICKSON.

AT the meeting of the London mathematical society held on April 27, the following papers were read : By G. T. BENNETT, "On the geometry of a deformable octahedron "; by W. P. MILNE, "A symmetrical method of apolarly generating cubic curves "; by G. N. WATSON, "The solution of the homogeneous linear difference equation of the second order (second paper) "; by G. B. MATHEWS, "A cartesian theory of complex geometrical elements of space "; by A. CUNNINGHAM, "The number of primes of given linear form "; by M. J. M. HILL, "On the proofs of the properties of Riemann's surfaces discovered by Lüroth and Clebsch."
At the meeting of May 11 the following papers were read : By G. T. BENNETT, "Exhibition of a model of a deformable octahedron "; by J. W. NICHOLSON, "The scattering of light by a large conducting sphere."

THE International commission on the teaching of mathematics will hold its meeting this year at Milan September 18–20 under the presidency of Professor F. KLEIN.

THE fourth international congress of philosophy was held at

Bologna April 6–11 under the presidency of Professor F. ENRIQUES.

THE Italian mathematical society Mathesis has undertaken the preparation of an encyclopedia of elementary mathematics, primarily for the use of teachers in the secondary schools. The board of editors is composed of Professors L. BERZOLARI, G. VIVANTI, F. GERBALDI, R. BONOLA and E. VENERONI. The work will comprise 44 monographs, to be published in three volumes, the first of which will treat of analysis, the second of geometry, and the third of applications, history, and didactics.

THE provisional report of the national committee of fifteen on geometry has been completed and will be presented at the next meeting of the National educational association to be held at San Francisco, July 8 to 14.

A SPANISH mathematical society has been organized at Madrid, where its first meeting was held on April 5. J. ECHEGARAY was elected president. The society will publish a *Bulletin* which will be in charge of C. J. RUEDA, L. O. DE TOLEDO, A. KRAHE and J. R. PASTOR.

TO perpetuate the memory of the late Professor J. TAN-NERY, of the Ecole Normale Supérieure, a committee composed of the director of the school, M. Poayet; M. Liard, the rector of the University of Paris; Professors Poincaré and Darboux have issued an appeal to all who knew Professor Tannery and to others who are mindful of the work he accomplished to assist in having his portrait hung in the public hall of the Ecole Normale. Contributions should be sent to the treasurer, M. Paul Pupuy, secretary of the Ecole Normale, 45 rue d'Ulm, Paris V.

THE Smith's prize committee of Cambridge University has declared G. H. LIVENS, of Jesus College, first prize man, for his essay : " The influence of density upon the position of lines of emission and absorption in a gas spectrum," and W. E. H. BERWICK, of Clare College, second prize man for his essay : " On the theory of relative fields." The essays of C. G. DARWIN, Trinity College, S. LEES, St. John's, and A. W. H. THOMPSON, Trinity, received honorable mention.

THE following doctorates in mathematics were conferred by the University of Paris during the academic year 1909–1910 :

L. ROY, " Recherches sur les propriétés thermo-mécaniques des corps solides" (doctorat d'état); M. HAAG, " Familles de Lamé, composées de surfaces égales, généralisation, applications " (doctorat d'état); Z. DE GEOCZE, " Quadrature des surfaces courbes " (doctorat d'université).

THE following university courses are announced for the summer of 1911 :

UNIVERSITY OF CHICAGO. Summer quarter (June 19–September 1). — By Professor E. H. MOORE : Integral equations, four hours, first term ; General analysis, five hours, first term. — By Professor J. W. YOUNG : Synthetic projective geometry, four hours. — By Professor J. W. A. YOUNG : Review of secondary mathematics, four hours. — By Professor G. A. BLISS : Elliptic integrals, four hours ; Calculus of variations, four hours. — By Professor H. F. BLICHFELDT : Finite collineation groups, four hours. — By Professor A. C. LUNN : Analytic mechanics, four hours ; Vector analysis, four hours.

COLUMBIA UNIVERSITY. Summer session (July 5–August 16). — By Professor H. S. WHITE : Theory of functions of a real variable. — By Professor EDWARD KASNER : Differential geometry. — By Professor W. B. FITE : Higher algebra.

INDIANA UNIVERSITY. Summer term (June 22 to September 1, 1911). — By Professor S. C. DAVISSON : Theory of surfaces, five hours. — By Professor D. A. ROTHROCK : Calculus of variations, five hours (first half-term) ; Advanced calculus, five hours ; History of mathematics (first half-term). — By Professor U. S. HANNA : Ordinary differential equations, five hours ; Surveying, five hours. — By Mr. K. P. WILLIAMS : Solid analytic geometry (first half-term).

THE following university courses are announced for the academic year 1911–1912 :

COLUMBIA UNIVERSITY. — By Professor C. J. KEYSER : Modern theories in geometry, three hours ; The principles of mathematics, three hours. — By Professor T. S. FISKE : Advanced calculus, introduction to the theory of functions of a real variable, three hours ; Theory of functions of a complex variable, three hours. — By Professor F. N. COLE : Theory of groups, three hours ; theory of invariants, three hours. — By

Professor JAMES MACLAY : Higher algebra, three hours ;
Elliptic functions, three hours. — By Professor D. E. SMITH :
History of mathematics, three hours. — By Professor EDWARD
KASNER : Differential equations, three hours, second half year ;
Dynamical geometry, three hours. — By Dr. N. J. LENNES :
General theory of assemblages, three hours.

The mathematical colloquium will meet at intervals of about
two weeks.

In October and November Professor J. HADAMARD, of the
Collége de France, will give at Columbia University courses
extending through four or five weeks as follows : Calculus of
variations, Tuesday and Thursday afternoons from four to six ;
Partial differential equations of physics, Wednesday and Friday
afternoons from four to six ; four lectures on The definition of
solutions of linear partial differential equations by boundary con-
ditions, Recent application of certain mathematical theories to
physical problems, Analysis situs, and Elementary solutions of
partial differential equations and Green's functions, Saturday
mornings from half past ten to half past twelve.

The Saturday lectures are open to all persons interested in
mathematics.

UNIVERSITY OF ILLINOIS. — By Professor E. J. TOWN-
SEND : Theory of functions of a complex variable, three hours;
Seminar in special topics in the theory of functions. — By Pro-
fessor S. W. SHATTUCK : Differential equations and calculus
of variations, three hours. — By Professor G. A. MILLER :
Theory of numbers, three hours. — By Professor H. L. RIETZ :
Theory of statistics, three hours. — By Professor C. H. SISAM :
Solid analytic geometry, three hours. — By Professor J. B.
SHAW : Theory of potential and related functions, three hours ;
Seminar course in general algebra. — By Professor A. EMCH :
Projective geometry, three hours. — By Dr. A. R. CRATHORNE :
Theory of functions of a real variable, three hours. — By Dr.
R. L. BÖRGER: Invariants and higher plane curves, three
hours. — By Dr. E. B. LYTLE : Teachers course in mathema-
tics, two hours (second semester).

INDIANA UNIVERSITY. — By Professor S. C. DAVISSON :
Theory of functions, three hours (a, w, s). — By Professor D.
A. ROTHROCK : Contact transformations, two hours (a, w) ;
Differential equations, three hours (a, w) ; Fourier series, three
hours (s). — By Professor U. S. HANNA : Elliptic functions,

two hours (a, w, s); Advanced calculus, three hours (a, w, s). — By Professor R. D. CARMICHAEL : Linear differential equations, three hours (a, w, s); Difference equations, three hours (a, w, s). (*Note:* Autumn, winter, spring terms are denoted by a, w, s.)

JOHNS HOPKINS UNIVERSITY. — By Professor F. MORLEY : Higher geometry, three hours ; Theory of functions, two hours ; Vector analysis, two hours. — By Professor A. B. COBLE : Theory of groups, three hours ; Theory of correspondences, three hours. — By Dr. A. COHEN : Elementary theory of functions, three hours ; Differential equations, two hours ; Differential geometry, two hours.

PRINCETON UNIVERSITY. — (In addition to the courses announced in the May BULLETIN.) By Professor O. VEBLEN : Seminar in geometric group theory, both terms.— By Professor G. D. BIRKHOFF : Seminar in linear difference equations, both terms. — By Professor E. P. ADAMS : Analytic mechanics, three hours.

YALE UNIVERSITY. — By Professor J. PIERPONT : Theory of functions of a complex variable, two hours ; Modern analytic geometry, two hours ; Advanced differential equations, two hours ; Theory of numbers, two hours. — By Professor P. F. SMITH : Differential geometry, two hours ; Geometric analysis, one hour. — By Professor E. W. BROWN : Mechanics, two hours ; Advanced calculus, three hours ; Celestial mechanics, two hours. — By Professor W. R. LONGLEY : Calculus of variations, two hours. — By Dr. H. F. MACNEISH : Differential equations, one hour. — By Dr. G. M. CONWELL : Foundations of geometry, two hours. — By Dr. G. F. GUNDELFINGER : Analytic geometry, two hours. — By Dr. D. D. LEIB : Transformations of space, two hours. — By Dr. E. J. MILES : Advanced algebra, two hours. — By Mr. W. A. WILSON : Theory of functions of a real variable, two hours.

PROFESSOR D. HILBERT, of the University of Göttingen, has been elected corresponding member of the academy of sciences of Paris. Professor LORENTZ, of the University of Leyden, has been elected foreign member of the same academy.

PROFESSOR M. NOETHER, of the University of Erlangen, has been elected foreign associate of the Italian academy of sciences (the XL).

PROFESSOR L. SCHLESINGER, of the University of Budapest, has accepted a professorship of mathematics at the University of Giessen.

PROFESSOR MAX DEHN, of the University of Münster, has been appointed to an associate professorship of mathematics at the University of Kiel.

THE Adams prize has been awarded to Professor A. E. H. LOVE for his paper on " Certain problems of geodynamics."

THE University of Aberdeen has conferred the honorary degree of LL.D. on Major P. A. MACMAHON.

THE following members of the mathematical staff of the University of Moscow have resigned: Professor CERASKI, S. TSCHAPLIGIN, Professor B. MLODZEJEWSKY, Dr. S. VINOGRADOW, Dr. A. VLASOV, Dr. A. VOLKOV, Dr. J. ZEGALKIN, Dr. A. POLJAKOV.

AT the meeting of the National academy of sciences held at Washington, April 20, Professor E. B. VAN VLECK, of the University of Wisconsin, was elected to membership ; Professor V. VOLTERRA, of the University of Rome, was elected a foreign associate.

PROFESSOR H. Y. BENEDICT, of the University of Texas, has been made dean of the college of arts.

AT the Massachusetts Institute of Technology, associate professor E. B. WILSON has been promoted to a full professorship of mathematics.

PROFESSOR J. W. YOUNG, of the University of Kansas, has been appointed professor of mathematics in Dartmouth College.

PROFESSOR J. K. WHITTEMORE, of Harvard University, has been appointed professor of mathematics at Western Reserve University.

PROFESSOR F. L. GRIFFIN, of Williams College, has been appointed professor of mathematics at Reed College, Portland, Ore.

DR. E. J. MILES, of Cornell University, has been appointed instructor in mathematics in the Sheffield Scientific School of Yale University.

AT the University of Illinois the following changes are announced : Dr. R. K. MORLEY, of the Worcester Polytechnic Institute, has been appointed instructor in mathematics ; Mr. E. B. STOUFFER and Mr. S. A. RAWLIN have been appointed assistants in mathematics. Dr. THOMAS BUCK has been appointed instructor in mathematics at the University of California.

MR. R. E. ROOT, of the University of Chicago, has been appointed instructor in mathematics at the University of Missouri.

DR. H. H. MITCHELL, of Yale University, has accepted an instructorship in mathematics at the University of Pennsylvania.

DR. FRANK IRWIN, of Princeton University, has been appointed instructor in mathematics in the University of California.

AT Columbia University Professor C. B. UPTON has been appointed secretary of Teachers College. Mr. L. L. DINES and Mr. G. H. GRAVES have been appointed instructors in mathematics.

PROFESSOR R. BONOLA, of the normal school at Rome, died May 16 at the age of 36 years.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

ASHTON (C. H.). Die Heineschen O-Funktionen und ihre Anwendungen auf die elliptischen Funktionen. (Diss.) München, 1909. 8vo. 62 pp.

BAKER (A. L.). Quaternions as the result of algebraic operations. New York, Van Nostrand, 1911. 12mo. 100 pp. $1.25

BAKER (R. P.). Problem of the angle-bisectors. Chicago, University of Chicago, 1911. 4to. 104 pp. $1.00

BALL (W. W. R.). Ricreazioni e problemi matematici dei tempi antichi e moderni. Bologna, Zanichelli, 1911. 8vo. 2+398 pp. L. 10.00

BRÜES (M.). Zur Theorie der desmischen Flächen vierter Ordnung. (Diss.) Bonn, 1910. 8vo. 48 pp.

CARLEBACH (J.). Lewi ben Gerson als Mathematiker. Ein Beitrag zur Geschichte der Mathematik bei den Juden. Berlin, Lamm, 1910. 8vo. 239 pp. Cloth. M. 6.00