NOTES

Professor J. R. Kline, of the University of Pennsylvania, has been appointed an associate editor of the Transactions of this Society.

The April, 1927, number of the Transactions of this Society (volume 29, No. 2) contains the following papers: *Singular case of pairs of bilinear, quadratic, or Hermitian forms*, by L. E. Dickson; *Triads of ruled surfaces*, by A. F. Carpenter; *Certain uniform functions of rational functions*, by E. P. Starke; *On rejection to infinity and exterior motion in the restricted problem of three bodies*, by B. O. Koopman; *A connected and regular point set which has no subcontinuum*, by R. L. Wilder; *Meromorphic functions with addition or multiplication theorems*, by J. F. Ritt; *Real functions with algebraic addition theorems*, by J. F. Ritt; *Concerning continua in the plane*, by G. T. Whyburn; *Extremals and transversality of the general calculus of variations problem of the first order in space*, by Jesse Douglas; *A figuratrix for double integrals*, by P. R. Rider; *Manifolds with a boundary and their transformations*, by Solomon Lefschetz; *On sets of functions of a general variable*, by L. L. Dines.

Two new volumes of the Society's Colloquium Series will appear in the summer of 1927: *Potential Theory*, by G. C. Evans, and *Algebraic Arithmetic*, by E. T. Bell. Orders for these volumes may be sent to the Society's office now, and the books will be sent when they appear; the price is $2.00 each (to members, $1.50). If desired, the members may have them charged on their bill of January, 1928. Two other volumes are in preparation and are expected to appear shortly: *The New Differential Geometry*, by L. P. Eisenhart, and *Dynamical Systems*, by G. D. Birkhoff.

The first issue of the American Journal of Mathematics in its new form, under the joint auspices of The Johns Hopkins University and this Society, as announced on page 1 of this volume of this Bulletin, has appeared as Number 1 of Volume 49. In addition to the Board of Editors previously announced, Professors E. T. Bell and F. D. Murnaghan are associate editors. This number contains the following papers: *Stability and the equations of dynamics*, by G. D. Birkhoff; *Quaternary quadratic forms representing all integers*, by L. E. Dickson; *Reduction formulas for the number of representations of integers in certain quadratic forms*, by E. T. Bell; *Generalization of certain theorems of Bohl, (second paper)*, by F. H. Murray; *Applications of the determinant and permanent tensors to determinants of general class and allied tensor functions*, by C. M. Cramlet; *Transformations leaving invariant certain partial differential equations of physics*, by R. D. Carmichael; *Transformations leaving invariant the heat equations of physics*, by J. A. Goff; *The application of fractional operators to functional equations*, by H. T. Davis; *Classification of quadrics in hyperbolic space*, by James Pierpont.

The following persons have been appointed associate editors of the Annals of Mathematics: as representing this Society, Professors D. C.

Gillespie, W. L. Hart, and R. E. Langer; as representing the Mathematical Association of America, Professors W. B. Ford, and Anna Pell-Wheeler.

The History of Science Society, in collaboration with committees of the American Mathematical Society, the Mathematical Association of America, the American Astronomical Society, and the American Physical Society, proposes to commemorate the 200th anniversary of the death of Sir Isaac Newton at a meeting to be held at Columbia University, November 25–26, 1927. Professor D. E. Smith is chairman of the program committee; the representatives of the American Mathematical Society and the Mathematical Association of America on this committee are professors R. C. Archibald, E. W. Brown, and Florian Cajori.

The Royal Academy of Sciences of Holland has awarded the Lorentz medal for distinguished service in the field of physics to Professor Max Planck, of the University of Berlin.

The Class of Physical Sciences of the Royal Academy of Bologna announces the following subjects for its Adolfo Merlani prize in mathematics: (1) to study by a direct method the problem of the extremals of the curvilinear integral $\int_C F(x, y; x', y'; x'', y'')dt$; (2) to present a monograph on conformal representation. Manuscripts or printed works published not earlier than 1927 on either subject, should be sent to the Secretary of the Class of Physical Sciences of the Academy before December 31, 1928. Competition is not limited to Italians.

Cambridge University announces the award of the following prizes: Smith's prizes to S. Goldstein, of St. John's College, and W. V. D. Hodge, of St. John's College, for essays entitled, respectively, *Mathieu functions* and *Linear systems of plane algebraic curves of any genus*; Rayleigh prizes to D. Burnet, of Clare College, and C. A. Meredith, of Trinity College, for essays entitled respectively, *Electric radiation over the earth's surface* and *Some theorems on infinite cardinals*. The subject announced for the Adams prize for 1927–28 is the following: *The variations of the earth's magnetic field in relation to electric phenomena in the upper atmosphere and on the earth*; a contribution to the theory of the origin of the various phenomena is desired.

The following have been elected foreign correspondents of the Reale Istituto Lombardo, Milan: Professors E. Borel and J. Hadamard, of Paris; Professors D. Hilbert and E. Landau, of Göttingen; Professor A. von Brill, of Tübingen.

Professor E. T. Bell, of the California Institute of Technology, has been elected a member of the National Academy of Sciences.

Professor G. D. Birkhoff, of Harvard University, has been elected an honorary member of the Edinburgh Mathematical Society.

The University of Lemberg has conferred an honorary doctorate on Professor R. A. Millikan, of the California Institute of Technology.

Professor E. W. Brown, of Yale University, has accepted the invitation of the Society to deliver its fifth Josiah Willard Gibbs Lecture, in connection with the meetings of the Society and the American Association for the Advancement of Science at Nashville, in December, 1927.

Professor Constantin Carathéodory, of the University of Munich, has been appointed visiting professor at Harvard University for the second half of the academic year 1927–28.

The following awards of Guggenheim fellowships for the coming academic year in the fields of mathematics and mathematical physics are announced: Dr. C. H. Eckert, of the California Institute of Technology. for research in quantum theory; Professor Philip Franklin, of the Massachusetts Institute of Technology, for the study of integral equations and orthogonal functions; Professor G. E. Gibson, of the University of California, for the study of the theory of band spectra; Dr. W. V. Houston, of the California Institute of Technology, for the study of quantum mechanics as applied to the explanation of spectra; Dr. F. C. Hoyt, of the University of Chicago, for research in quantum theory and its relation to radiation and atomic structure; Professor V. F. Lenzen, of the University of California, for the study of statistical mechanics; Professor M. S. Vallarta, of the Massachusetts Institute of Technology, to study the connection between . Schrödinger's wave mechanics and the Einstein theory of relativity; Professor H. S. Vandiver, of the University of Texas, for research on Fermat's last theorem and the laws of reciprocity in the theory of algebraic numbers.

Professor Eugenie M. Morenus of Sweet Briar College has been awarded the Anna B. Brackett Memorial Fellowship by the American Association of University Women.

Dr. O. Mader has been appointed professor of mechanics at the Munich Technical School.

Dr. J. E. Lennard-Jones, of the University of Bristol, has been promoted to a professorship of theoretical physics.

The following have been appointed docents in European universities: Dr. Richard Brauer, in mathematics, at the University of Königsberg; Dr. Georg Feigl, in mathematics, at the University of Berlin; Dr. Pasqual Jordan, in theoretical physics, at the University of Göttingen; Dr. Kornel Lanczos, in theoretical physics, at the University of Frankfurt a. M.; G. Mammana and E. Raimondi, in algebraic analysis and rational mechanics, respectively, at any Italian universities of their choice.

Princeton University has established a professorship in memory of Charles A. Young, who was professor of astronomy at the University from 1887 to 1908. Professor H. N. Russell, director of the Princeton Observatory, has been made the first incumbent.

Yale University plans to honor the memory of Josiah Willard Gibbs by the establishment of a Gibbs Fund of $250,000, the income of which will be devoted to the departments of chemistry, physics, and mathematics.

The list of doctorates conferred by American Universities during 1926, as published in the May–June issue of this Bulletin, should have included the following:

Christine Ladd-Franklin, Johns Hopkins, February, *On the algebra of logic.*

G. M. Merriman, Cincinnati, June, *Sufficient conditions for the summability of double series, with applications to the double Fourier series.*

The following graduate courses in mathematics are announced or the academic year 1927–1928.

BROWN UNIVERSITY.—By Professors R. G. D. Richardson and C. R. Adams: Introduction to advanced analysis.—By Professors J. D. Tamarkin and C. R. Adams: Seminary course.—By Professor A. A. Bennett. Advanced algebra.—By Professor J. D. Tamarkin: Theory of differential equations.

UNIVERSITY OF CALIFORNIA.—By Professor Florian Cajori: Seminar on foundations of the calculus, I; Seminar on history of algebra, II; The teaching of mathematics in secondary schools, I.—By Professor B. A. Bernstein: Logic of algebra, I; Logic of Geometry, II; Seminar on foundations of mathematics, II.—By Professor M. W. Haskell: Line geometry, I; Theory of continuous groups.—By Professor D. N. Lehmer: Algebraic curves and surfaces, II; Theory of Numbers, II.—By Professor Pauline Sperry: Differential geometry, I; Projective differential geometry, II.—By Professor J. H. McDonald: Functions of a complex variable; Advanced analytic mechanics.—By Professor T. M. Putnam: Special analytic functions, I; Partial differential equations, II.—By Professor Frank Irwin: Integral equations, I; Galois theory of equations, II.—By Professor C. A. Noble: Calculus of variations.

UNIVERSITY OF CHICAGO.—By Professor E. H. Moore: General analysis, I, II, III, IV, V; Seminar on foundations of mathematics.—By Professor H. E. Slaught: Differential equations; Definite integrals.—By Professor G. A. Bliss: Calculus of variations and Riemannian geometry; Partial differential equations; Algebraic functions; Boundary value problems in the calculus of variations; Thesis work in analysis.—By Professor L. E. Dickson: Topics in algebra; Topics in the theory of numbers; Advanced topics in algebra and the theory of numbers; Thesis work in algebra and theory of numbers.—By Professor E. P. Lane: Analytic projective geometry; Space curves and ruled surfaces; Solid analytic geometry; Differential geometry.—By Professor A. C. Lunn: Statistics and probability; Vector analysis; Dyadics and crystal physics; Fourier series and Bessel functions; Units and dimensions; Vector analysis in Riemannian-Einstein space.—By Professor M. I. Logsdon: Advanced analytic geometry; Algebraic geometry; Algebraic invariants.—By Pro-

fessor W. D. MacMillan: Analytic mechanics I, II; Celestial mechanics; Dynamics of rigid bodies.—By Professor L. M. Graves: Vectors, matrices and quaternions; Functions of a complex variable; Functions of a real variable.—By Professor R. W. Barnard: Limits and series.—By Professor Walter Bartky: Modern theories of differential equations, I, II; Vector analysis; Electrodynamics; Quantum mechanics. In connection with all advanced courses students may register for Reading and Research.

UNIVERSITY OF CINCINNATI.—By Professor Harris Hancock: Advanced calculus; Theory of algebraic numbers; Thesis work in algebraic numbers.—By Professor Louis Brand: Mechanics of deformable bodies; Electrodynamics.—By Professor C. N. Moore: Theory of functions of a real variable; Course in reading and research.—By Professor R. E. Hundley: Advanced technical mechanics.—By Professor C. A. Garabedian: Elasticity, II; Thesis work in elasticity.—By Professor W. C. Osterbrock: The differential equations of engineering.—By Professor I. A. Barnett: Integral equations.—By Professor Meyer Salkover: Quantum theory and atomic structure.

COLUMBIA UNIVERSITY.—By Professor T. S. Fiske: Elementary exposition of modern advances in mathematical science; Theory of functions.—By Professor E. Kasner: Seminar in differential geometry.—By Professor W. B. Fite: Differential equations.—By Professor J. F. Ritt: Elliptic functions.—By Professor G. A. Pfeiffer: Principles and scope of geometry.—By Dr. B. O. Koopman: Mathematical theory of deformable media, with applications to hydro-dynamics and elasticity; Partial differential equations of mathematical physics.

CORNELL UNIVERSITY.—By Professor J. I. Hutchinson: Theory of functions of a complex variable.—By Professor Virgil Snyder: Projective geometry.—By Professor F. R. Sharpe: Hydro-dynamics and elasticity.—By Professor Arthur Ranum: Theory of numbers.—By Professor W. A. Hurwitz: Differential equations of mathematical physics.—By Professor W. B. Carver: Theory of finite groups.—By Professors Hutchinson and Carver: Elementary differential equations.—By Professor D. C. Gillespie: Principles of mechanics.—By Professor C. F. Craig: Modern higher algebra.—By Mr. P. A. Fraleigh: Advanced calculus.—By Dr. B. F. Kimball: Differential geometry of curves and surfaces.—By Mr. H. Poritsky: Graphical and mechanical computations; Wave motion.—By Mr. H. C. Shaub: Advanced analytic geometry.

HARVARD UNIVERSITY.—By Professor W. F. Osgood: Functions of real variables, I.—By Professor J. L. Coolidge: Higher geometry.—By Professor E. V. Huntington: Mathematical methods in statistics.—By Professor G. D. Birkhoff: Problem of three bodies.—By Professor W. C. Graustein: Introduction to modern geometry; Advanced calculus, I; Projective geometry.—By Professor Marston Morse: Theory of potential II; Functions of real variables, II.—By Professor H. W. Brinkman: Advanced calculus, II; Theory of numbers.—By Dr. H. M. Stone: Probability

calculus, II; Theory of numbers.—By Dr. M. H. Stone: Probability; Analytical theory of heat, problems in elastic vibrations; Expansion problems connected with ordinary differential equations.—By Dr. M. S. Demos: Calculus of variations. Professor Morse will conduct a fortnightly seminar in the theory of functions. Courses of research are offered by Professor Osgood in the theory of functions, by Professor Coolidge in geometry, by Professor Huntington in postulate-theory, by Professor Birkhoff in the theory of differential equations, by Professor Graustein in geometry, by Professor Morse in analysis situs, by Professor Walsh in analysis, by Professor Brinkmann in the theory of groups, and by Dr. Stone in expansion problems.

UNIVERSITY OF ILLINOIS.—By Professor E. J. Townsend: Functions of a complex variable.—By Professor G. A. Miller: Theory of groups. —By Professor J. B. Shaw: Linear algebra.—By Professor R. D. Carmichael: Linear differential equations.—By Professor A. Emch: Algebraic geometry.—By Professor A. R. Crathorne: Theory of probability.—By Professor O. C. Hazlett: Theory of numbers.

UNIVERSITY OF IOWA.—By Professor H. L. Rietz: Actuarial theory; Statistics; Seminar in actuarial science and statistics.—By Professor E. W. Chittenden: Advanced calculus; Functions of a real variable. —By Professor R. P. Baker: Theoretical mechanics; Higher algebra.—By Professor J. F. Reilly: Partial differential equations; Mathematics of finance; Finite differences.—By Professor Roscoe Woods; Advanced analytic geometry; Solid analytic geometry.—By Professor C. C. Wylie: Celestial mechanics.—By Dr. L. E. Ward: Functions of a complex variable. —By Dr. N. B. Conkwright: Differential equations; Theory of equations.

JOHNS HOPKINS UNIVERSITY.—By Professor F. Morley: Inversive By Professor A. Cohen: Theory of functions; Differential equations and advanced calculus.—By Professor F. D. Murnaghan: Hydro dynamics; Elasticity; Tensor analysis; New quantum mechanics.—By Professor J. R. Musselman: Projective geometry.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.—By Professor F. S. Woods: Advanced calculus.—By Professor D. P. Bartlett: Least squares and probability.—By Professor C. L. E. Moore: Theoretical aeronautics; Advanced wing theory; Rigid dynamics.—By Professor H. B. Phillips: Vector analysis; Theory of the gyroscope.—By Professor G. Rutledge: Theory of functions; Modern algebra.—By Dr. D. J. Struik: Differential geometry.—By Professor N. Wiener: Fourier series and integral equations.

UNIVERSITY OF MICHIGAN.—By Professor J. L. Markley: Studies in the differential and integral calculus.—By Professor J. W. Glover: Theory of probability; Finite differences; Advanced mathematical theory of interest and life contingencies.—By Professor W. B. Ford: Advanced calculus with especial reference to Fourier series and harmonic analysis; Infinite series and products; Advanced differential equations.— By Professor L. C. Karpinski: Higher algebra; Teachers' seminary in

mathematics; History of mathematics.—By Professor Peter Field: Advanced mechanics; Theory of the potential; Vector analysis.—By Professor T. R. Running: Graphical methods; Empirical formulas; Differential equations for chemical engineers; Mathematical theory of heat conduction. —By Professor J. W. Bradshaw: Descriptive geometry; Projective geometry.—By Professor T. H. Hildebrandt: Theory of functions of a real variable.—By Professor C. E. Love: Infinite processes; Differential equations.—By Professor H. C. Carver: Mathematical theory of statistics; Advanced mathematical theory of interest and life contingencies.—By Professor L. A. Hopkins: Celestial mechanics.—By Professor V. C. Poor: Elements of elasticity and hydrodynamics.—By Professor C. J. Coe: Analytic mechanics; Integral equations.—By Professor L. J. Rouse: Advanced calculus; Fourier series and harmonic analysis.—By Professor W. W. Denton: Advanced calculus; Elements of mechanics; Partial differential equations of physics.—By Professor N. H. Anning: Differential equations; Theory and use of mathematical instruments.—By Professor J. A. Shohat: Selected topics in analysis.—By Professor J. A. Nyswander: Higher algebra; Algebraic theory; Modern theory of differential equations. —By Professor G. Y. Rainich: Quadratic forms and quadratic numbers; Theory of functions of a complex variable; Differential geometry; Mathematics of relativity.—By Professor R. L. Wilder: Analysis situs.—By Mr. D. K. Kazarinoff: Projective geometry for engineers; Calculus of variations; Mathematical theory of aerofoils; Advanced stability.—By Mr. O. J. Peterson: Solid analytic geometry.—By Mr. S. E. Field: Differential equations.

OHIO STATE UNIVERSITY.—By Professor H. W. Kuhn: Theory of equations; Ordinary differential equations.—By Professor S. E. Rasor: Functions of a complex variable.—By Professor H. Blumberg: Introduction to modern mathematics; Point sets; Problems in analysis.—By Professor C. C. Morris: Theory of probability; Advanced statistics.—By Professor J. H. Weaver: Advanced euclidean geometry; Advanced calculus.—By Professor C. C. MacDuffee: Theory of numbers; Theory of algebraic numbers; Linear algebras.—By Professor A. D. Michal: Fourier series; Partial differential equations; Calculus of variations.—By Professor Grace Bareis: Synthetic projective geometry; Advanced analytic geometry.—By Professor C. T. Bumer: Finite differences; Actuarial theory; Vector analysis.

PRINCETON UNIVERSITY.—By Professor H. B. Fine: Theory of elimination, (first term).—By Professor L. P. Eisenhart: Differential geometry; Riemannian geometry.—By Professor O. Veblen: Seminary.—By Professor J. H. M. Wedderburn: Linear algebras, (second term).—By Professor S. Lefschetz: Analysis situs; Functions of a complex variable.—By Professor J. W. Alexander: Functions of a real variable; Partial differential equations

RICE INSTITUTE.—By Professor G. C. Evans: Differential and integral equations; General dynamics and relativity.—By Professor L. R. Ford: Theory of functions of a complex variable; Algebraic functions and their

integrals.—By Professor H. E. Bray: Theory of functions of a real variable.
—By Dr. A. H. Copeland: Finance: Statistics; Probability.

UNIVERSITY OF TEXAS.—By Professor M. B. Porter: Analytic func-
tions.—By Professor R. L. Moore: Point sets and continuous trans-
formations; Research in point-set theory.—By Professor E. L. Dodd:
Infinite processes; Research in probability.—By Professor H. J. Ettlinger:
Theory of elasticity; Research in differential equations.—By Professor
P. M. Batchelder: Relativity.—By Professor A. E. Cooper: Continuous
groups.

YALE UNIVERSITY.—By Professor James Pierpont: Theory of func-
tions of a complex variable; Differential geometry, I.—By Professor
P. F. Smith: Geometrical transformations and continuous groups.—By
Professor E. W. Brown: Advanced mechanics.—By Professor W. R.
Longley: Approximation methods.—By Professor W. A. Wilson: Functions
of real variables.—By Professor E. J. Miles: Calculus of variations, I.—By
Professor J. K. Whittemore: Differential geometry, II.—By Professor
J. I. Tracey: Analytic geometry, I.—By Dr. L. T. Moore: Higher Algebra.
—By Dr. H. M. Gehman: Plane analysis situs.—By Dr. C. A. Shook:
Potential theory and Laplace's equations; Hydromechanics.

Professor A. A. Bennett, of Lehigh University, has been appointed
professor of mathematics at Brown University.

Dr. H. W. Brinkmann, of Harvard University, has been promoted to
an assistant professorship of mathematics.

Professor J. L. Coolidge, of Harvard University, has been appointed
exchange professor to France; he will lecture at the Sorbonne on algebraic
plane curves.

Professor Tobias Dantzig, of the University of Maryland, lectured
during the academic year 1926–27 at the Bureau of Standards on the
mathematical theory of elasticity.

Professor W. C. Eells, of the department of applied mathematics at
Whitman College, has been appointed associate professor of education at
Stanford University.

Professor Tomlinson Fort, of Hunter College, has been appointed head
of the department of mathematics at Lehigh University.

Dr. H. M. Gehman, of Yale University, has been promoted to an
assistant professorship of mathematics.

Professor R. L. Green, of Stanford University, has retired.

Dr. C. M. Huber, of Rutgers University, has been promoted to an
assistant professorship of mathematics.

Dr. L. S. Hulburt, collegiate professor of mathematics at Johns Hopkins
University, has retired.

Assistant Professor M. H. Ingraham, of Brown University, has accepted a professorship of mathematics at the University of Wisconsin.

Associate Professor O. D. Kellogg, of Harvard University, has been promoted to a full professorship of mathematics.

Professor C. J. Keyser, of Columbia University, has retired, as Adrain professor emeritus.

Assistant Professor R. E. Langer, of Brown University, has accepted a professorship of mathematics at the University of Wisconsin.

Dr. Harry Levy has been appointed assistant professor of mathematics at the University of Illinois.

Associate Professor I. Maizlich has been promoted to a full professorship at Centenary College.

Professor E. D. Meacham has been made assistant dean of the College of Arts and Sciences at the University of Oklahoma.

Dr. A. D. Michal has been appointed assistant professor of mathematics at the Ohio State University.

Professor J. J. Nassau, of Case School of Applied Science, has been granted a year's leave of absence, beginning next September, to study at Cambridge University.

Dr. Oystein Ore, of the University of Oslo, has been appointed assistant professor of mathematics at Yale University.

Assistant Professor G. E. Raynor, of Wesleyan University, has been appointed associate professor of mathematics at the University of Oklahoma.

Associate Professor W. D. Reeve, of Teachers' College, Columbia University has been promoted to a full professorship of mathematics.

Dr. D. E. Richmond has been appointed assistant professor of mathematics at Williams College.

Assistant Professor J. F. Ritt has been promoted to an associate professorship of mathematics at Columbia University.

Dr. C. A. Shook has been promoted to an assistant professorship of mathematics at Yale University.

Assistant Professor J. D. Tamarkin, of Dartmouth College, has been appointed assistant professor of mathematics at Brown University.

Mr. H. S. Thurston, of Brown University, has been appointed professor of mathematics at Acadia University.

Associate Professor W. A. Wilson has been promoted to a full professorship at Yale University.

The following appointments to instructorships in mathematics are announced:

Brown University, Mr. A. O. Hickson;

Harvard University, Dr. M. S. Demos, Dr. M. H. Stone of Columbia University;

University of Iowa, Mr. John Stehn;

Yale University, Mr. H. T. Engstrom, Mr. T. H. Rawles.

Dr. A. H. Bucherer, professor of mathematical physics at the University of Bonn, died April 16, 1927, at the age of sixty-two.

Dr. Franz Mertens, formerly professor of mathematics at the University of Vienna, is dead.

M. Daniel Berthelot, professor of physics at the University of Paris, has died, at the age of sixty-two.

Mr. H. B. Goodwin, formerly examiner in nautical astronomy at the Royal Naval College, Greenwich, died February 24, 1927, at the age of seventy-nine.

Professor R. F. Borden, of George Washington University, died March 15, 1927. Professor Borden had been a member of this Society since 1920.

Dr. F. H. Loud, emeritus professor of mathematics and astronomy at Colorado College, has died, at the age of seventy-five.