

on certain interesting newspaper problems, a problem of exchange under war conditions, an incident in connection with Kästner's epigram on logarithms, and, finally, the Fermat problem.

All this is told in a style that is in harmony with the nature of the work and that would repay the reader even if the anecdotes themselves did not seem worth his time, which is far from being the case.

DAVID EUGENE SMITH.

NOTES.

THE July number (volume 17, number 3) of the *Transactions of the American Mathematical Society* contains the following papers: "On a general class of series of the form $\sum c_n g(x+n)$," by R. D. CARMICHAEL; "The geometries associated with a certain system of Cremona groups," by J. W. YOUNG and F. M. MORGAN; "A reduction of certain analytic differential equations to differential equations of an algebraic type," by W. D. MACMILLAN; "A new canonical form of the elliptic integral," by BESSIE I. MILLER; "On the notion of summability for the limit of a function of a continuous variable," by L. L. SILVERMAN; "On the factorization of Cremona plane transformations," by J. W. ALEXANDER; "Weierstrass's non-differentiable function," by G. H. HARDY; "Finite groups represented by special matrices," by G. A. MILLER; "On infinite regions," by W. F. OSGOOD; "Point sets and allied Cremona groups (Part II)," by A. B. COBLE; "Infinite products of analytic matrices," by G. D. BIRKHOFF.

THE July number (volume 38, number 3) of the *American Journal of Mathematics* contains the following papers: "A class of asymptotic orbits in the problem of three bodies," by L. A. H. WARREN; "Some invariants of the ternary quartic," by H. I. THOMSEN; "Functions of surfaces with exceptional points or curves," by C. A. FISCHER; "Dupin's cyclide as a self-dual surface," by MABEL M. YOUNG; "Projective differential geometry of one-parameter families of space curves, and conjugate nets on a curved surface. Second memoir," by G. M. GREEN; "The asymptotic equation and satellite conic of the plane quartic," by TERESA COHEN.

THE June number (series 2, volume 17, number 4) of the *Annals of Mathematics* contains the following papers: "On the Wronskian test for linear dependence," by MAXIME BÔCHER; "Note on a theorem on envelopes," by W. R. LONGLEY; "Non-essential singularities of functions of several complex variables," by DUNHAM JACKSON; "A congruence of circles," by F. W. BEAL; "A case of iteration in several variables," by A. A. BENNETT; "The arithmetic genus of an algebraic manifold immersed in another," by S. LEFSCHETZ; "A characteristic property of self-projective curves," by L. L. DINES.

THE September number (volume 18, number 1) of the *Annals of Mathematics* contains: "On the surface of lowest degree passing through a given curve in space," by T. HAYASHI; "A practical method of determining elementary divisors," by H. T. BURGESS; "Conjugate systems with equal point invariants," by L. P. EISENHART; "On the derivatives of a function at a point," by J. F. RITT; "An existence theorem for the solution of a type of real mixed difference equation," by A. A. BENNETT; "Double elliptic geometry in terms of point and order alone," by J. R. KLINE; "An application of a group of order 16 to a configuration on an elliptic curve," by A. EMCH.

AT the meeting of the Edinburgh mathematical society on June 9 the following papers were read: By E. T. WHITTAKER: "On the solution of Riccati's equation by continued fractions"; by H. DATTA: "On symmetric determinants and Pfaffians"; by A. B. JEFFERY: "Bipolar and toroidal coordinates"; by W. P. MILNE: "The polars of the Hessian of a cubic curve" and "Determinantal systems of points"; by F. G. TAYLOR: "An involution pencil of whole-plane birationally related cubics."

A meeting of mathematicians from Sweden, Denmark, Finland, and Norway was held at Stockholm August 30-September 2. It will be recalled that the Sixth International Congress of Mathematicians was to have met at Stockholm at that time.

THE firm of John Wiley and Sons announces the publication of *Lectures on Ten British Mathematicians of the Nineteenth Century*, by the late ALEXANDER MACFARLANE.

THE following advanced courses in mathematics are offered at the Italian universities during the academic year 1916-1917:

UNIVERSITY OF BOLOGNA.—By Professor P. BURGATTI: Mechanics of continuous bodies, especially of viscous fluids and elastic bodies, three hours.—By Professor L. DONATI: Modern electromagnetic theories, with reference to recent researches of H. Kamerlingh Onnes and A. Righi, three hours.—By Professor F. ENRIQUES: Theory of singularities of algebraic functions, three hours.—By Professor S. PINCHERLE: Theory of sets; theory of functions of a real variable; the modern meaning of definite integration; Fourier's series, three hours.

UNIVERSITY OF CATANIA.—By Professor E. DANIELE: Introduction to the general theories of electricity and magnetism, four hours.—By Professor G. PENNACCHIETTI: Hydrodynamics, four hours.—By Professor G. SCORZA: Abelian functions with geometrical applications, three hours.—By Professor C. SEVERINI: Advanced part of differential and integral calculus, four hours.

UNIVERSITY OF GENOA.—By Professor E. E. LEVI: Functions of one and several complex variables, four hours.—By Professor G. LORIA: Theory of algebraic surfaces, especially cubics and quartics, three hours.—By Professor O. TEDONE: Principles of the mechanics of electrons, three hours.

UNIVERSITY OF MESSINA.—By Professor P. CALAPSO: Functions of a complex variable; elliptic functions, four hours.—By Professor G. Z. GIAMBELLI: Hyperspaces; moduli of algebraic forms; forms in several series of variables, four hours.—By Professor E. LAURA: Electromagnetic theory of light, three hours.

UNIVERSITY OF NAPLES.—By Professor F. AMODEO: History of mathematics from Galileo to Newton, three hours.—By Professor A. DEL RE: Analysis of Grassmann and theoretical astronomy, four and one half hours.—By Professor R. MARCOLONGO: Mathematical theory of vibrations of isotropic elastic bodies, three hours.—By Professor D. MONTESANO:

Geometry of the space of conics, three hours.—By Professor E. PASCAL: Selected topics of mathematical analysis, three hours.—By Professor L. PINTO: Electro-optics; hertzian waves, three hours.

UNIVERSITY OF PADUA.—By Professor F. D'ARCAIS: Harmonic and polyharmonic functions; analytic functions; integral equations, four hours.—By Professor P. GAZZANIGA: Theory of numbers, four hours.—By Professor T. LEVI-CIVITA: General principles of analytic mechanics; newtonian potential; relativity; Einstein's gravitational statics, four hours.—By Professor G. RICCI: Absolute differential calculus; elasticity, four hours.—By Professor F. SEVERI: Algebraic geometry, four hours.—By Professor A. TONOLO: Partial differential equations of the first order, three hours.—By Professor G. VERONESE: Foundations of geometry, three hours.

UNIVERSITY OF PALERMO.—By Professor G. BAGNERA: Theory of complex variables; elliptic and modular functions, three hours.—By Professor M. DE FRANCHIS: Jacobi's inversion problem and Picard's varieties; hyperelliptic surfaces, three hours.—By Professor M. GEBBIA: Mechanics of continuous media; newtonian potential; hydrostatics and hydrodynamics, four and one half hours.—By ———: Mechanics (advanced part), three hours.

UNIVERSITY OF PAVIA.—By Professor L. BERZOLARI: General theory of algebraic forms with geometrical applications, three hours.—By Professor U. CISOTTI: Ancient and modern analytical methods of mathematical physics and their most conspicuous applications, three hours.—By Professor F. GERBALDI: Functions of a complex variable; elliptic functions, three hours.—By Professor G. VIVANTI: Theory of partial differential equations, three hours.

UNIVERSITY OF PISA.—By Professor E. BERTINI: The geometry on an algebraic curve with transcendental method, three hours.—By Professor L. BIANCHI: Theory of functions of a complex variable; elliptic functions, four and one half hours.—By Professor U. DINI: General theory of series, particularly of divergent ones; analytic representation of

function in real and complex fields, four and one half hours.—By Professor G. A. MAGGI: The potential function and its direct applications; equilibrium and motion of elastic bodies, four and one half hours.—By Professor P. PIZZETTI: Introduction to spherical astronomy and to determination of elliptic orbits; mechanical theory of the shape and of the motion of rotation of the planets, four and one half hours.

UNIVERSITY OF ROME.—By Professor G. BISCONCINI: Geometrical applications of calculus, three hours.—By Professor G. CASTELNUOVO: Differential geometry, three hours.—By Professor U. CRUDELI: Functions of lines, three hours.—By Professor L. SILLA: Kinematics and mechanisms, three hours.—By Professor V. VOLTERRA: Selected problems of mathematical physics, three hours; Hydrodynamics and aerodynamics, three hours.

UNIVERSITY OF TURIN.—By Professor T. BOGGIO: Potential; selected topics of analytical mechanics, three hours.—By Professor G. FUBINI: Cantor's numbers; entire and algebraic entire numbers; theory of numbers and forms with algebraic applications; applications of analysis to the theory of numbers, three hours.—By Professor C. SEGRE: Higher views concerning elementary geometry, three hours.—By Professor C. SOMIGLIANA: Electromagnetism with special regard to propagation phenomena, three hours.

PROFESSOR H. HAHN, of the University of Czernowitz, has been appointed professor of mathematics at the University of Bonn.

PROFESSOR C. JUEL has retired from the editorial board of the *Nyt Tidsskrift for Matematik*. Professor P. HEEGAARD, of the University of Copenhagen, is his successor.

PROFESSOR E. ZERMELO, of the University of Zurich, has retired. Professor R. FUETER, of the technical school at Carlsruhe, has been appointed his successor.

PROFESSOR G. SCORZA, of the University of Parma, has been promoted to a full professorship of projective and descriptive geometry, and transferred to the University of Catania for the current year.

THE Italian society of sciences (the forty) has awarded its gold medal for 1915 to Professor P. CALAPSO, of the University of Messina, for his researches in geometry, especially in the extensional deformation of quadrics.

PROFESSOR F. GERBALDI, of the University of Pavia, has been elected to membership in the Royal institute of Lombardy.

DURING the months of May and June, Professor J. HADAMARD, of the Ecole Polytechnique, gave a series of lectures on mathematical analysis at the Universities of Bologna, Genoa, and Rome.

DR. J. W. L. GLAISHER, of Trinity College, Cambridge, has been elected a member of the Royal society of Edinburgh.

HON. BERTRAND RUSSELL, former fellow of Trinity College, Cambridge, will be unable to lecture at Harvard University during the present year.

AT Vassar College, Dr. ELIZABETH B. COWLEY has been promoted to an associate professorship of mathematics.

DR. C. L. E. MOORE, of the Massachusetts Institute of Technology, has been promoted to an associate professorship of mathematics.

AT the Rice Institute, Professor G. C. EVANS has been promoted to a full professorship of pure mathematics, and Dr. W. C. GRAUSTEIN to an assistant professorship of mathematics. Dr. F. D. MURNAGHAN, of Johns Hopkins, has been appointed to an instructorship in mathematics, and Mr. H. E. BRAY, of Harvard University, has been appointed to one of the two graduate fellowships in mathematics.

DR. A. A. BENNETT, of Princeton University, has been appointed adjunct professor of mathematics at the University of Texas.

PROFESSOR C. N. HASKINS, of Dartmouth College, has been promoted to a full professorship of mathematics.

MR. W. C. EELLS has resigned his position in the department of mathematics at the United States Naval Academy to accept an appointment as professor of applied mathematics at Whitman College, Walla Walla, Wash.

DR. D. D. LEIB, instructor in mathematics at the Sheffield Scientific School, Yale University, has been appointed assistant professor of mathematics and physics at the Connecticut College for Women.

AT the University of Kansas, Dr. S. LEFSCHETZ and Mr. J. WHEELER have been promoted to assistant professorships and Mr. E. B. MILLER, of the University of Chicago, has been appointed to an instructorship in mathematics.

AT Northwestern University, Dr. C. N. YEATON has been promoted to an assistant professorship of mathematics. Dr. C. E. WILDER, of Pennsylvania State College, Dr. F. E. WOOD, and Mr. I. ROMAN have been appointed instructors in mathematics.

DR. OTTO DUNKEL, of the University of Missouri, has been appointed assistant professor of mathematics at Washington University, St. Louis.

DR. J. E. ROWE, of Pennsylvania State College, has been promoted from an assistant to an associate professorship of mathematics.

DR. R. L. BORGER, of the University of Illinois, has been appointed professor of mathematics at Ohio University, Athens, Ohio.

DR. G. H. LIGHT has been appointed instructor in mathematics at the University of Colorado.

DR. J. V. DE PORTE, of Cornell University, has been appointed instructor in mathematics at the State college for teachers, Albany.

AT Syracuse University, Dr. J. L. JONES, of the University of Pittsburgh, has been appointed instructor in mathematics.

At the University of Nebraska, Mr. A. BABBETT and Miss M. A. COLPITTS have been appointed instructors in mathematics.

DR. N. ALTSHILLER, of the University of Colorado, has been appointed instructor in mathematics at the University of Oklahoma.

DR. S. P. SOUSLEY, of St. Mary's College, Emmetsburg, Maryland, has been appointed instructor in mathematics at Pennsylvania State College.

PROFESSOR E. MACH, of the University of Vienna, died February 22, 1916, at the age of 78 years.

DR. K. SCHWARZSCHILD, director of the observatory at Potsdam, died May 11, 1916, at the age of 42 years.

PROFESSOR W. VOGT, of the University of Heidelberg, was killed in battle March 3, 1916, at the age of 32 years.

DON JOSE ECHEGARAY, professor of mathematical physics in the University of Madrid, and distinguished also as a poet and dramatic author, died September 15, 1916, at the age of eighty-three years. Professor Echegaray was a member of the academy of science of Madrid, which celebrated the fiftieth anniversary of his admission to the academy on March 12, 1916.

EDGAR H. HARPER, professor of mathematical physics in University College, Cork, known for his work on aviation, was killed while serving as a lieutenant.

DR. G. A. HILL, formerly professor of physics at Harvard University, and author of a number of text books in physics and mathematics, died August 17, 1916, at the age of 74 years.

PROFESSOR J. P. D. JOHN, formerly professor of mathematics at De Pauw University, died August 7, 1916, at the age of 73 years.

PROFESSOR W. C. ESTY, of Amherst College, died July 27, 1916, at the age of 78 years. Professor Esty was Walker

professor of mathematics from 1865 to his retirement from active service in 1905.

DR. EMORY McCLINTOCK died July 10 at the age of seventy-six years. Dr. McClintock was the first president of the American Mathematical Society, serving in that office from 1890 to 1894. He graduated from Columbia College in 1859 and was assistant professor of mathematics at Columbia in 1859 and 1860. He was actuary of the Asbury Life Insurance Company from 1867 to 1871, and of the Northwestern Mutual Life Insurance Company from 1871 to 1888, when he became connected with the Mutual Life Insurance Company of New York, of which he was also vice-president from 1905 to his retirement in 1911. He was a frequent contributor to the *American Journal of Mathematics* and other journals, and was one of the founders of the *Transactions* of the American Mathematical Society.

FREDERICK W. FRANKLAND died in New York City on July 24, in the sixty-second year of his age. He was a Fellow of the Institute of Actuaries, and a member of the American Mathematical Society since 1893. He was for several years government examiner in mathematics and insurance in New Zealand, and was author of numerous papers on mathematical, metaphysical, and sociological subjects.

JOSIAH ROYCE, Alvord professor of philosophy at Harvard University, died September 14, 1916, at the age of sixty years.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

ABENBÉDER. See PÉREZ (J. A. S.).

BENEDICT (S. R.). A comparative study of the early treatises introducing into Europe the Hindu art of reckoning. (Diss., University of Michigan.) Concord, N. H., Rumford Press, 1916. 6+126 pp.

BIANCHI (L.). Lezioni sulla teoria delle funzioni analytiche di variabile complessa e delle funzioni ellittiche. 2a edizione. Pisa, E. Spoerri (F. Mariotti), 1916. 8vo. 685 pp. L. 25.00

CASHMORE (M.). Fermat's last theorem. London, Bell, 1916. 63 pp. 2s.

COOLIDGE (J. L.). A treatise on the circle and the sphere. Oxford, Clarendon Press, 1916. 602 pp. 21s.

GREGORY (R. A.). Discovery: or, the spirit and service of science. London, Macmillan, 1916. 10+340 pp. 5s.