agreement, both as to the character and extent of the markings. I imagine that Professor Jacoby regards all the details that he himself sees on Mars as real, and not the product of his imagination, even though some of them might not be seen by others, less experienced than himself.

It seems to me very unfortunate that statements, such as those quoted above, should be made in a popular book by a professor of astronomy. They are in no way calculated to increase the confidence of the public in the value of astronomic study. Perhaps the writer did not mean them to be as far-reaching as they seem. Doubtless he merely overstated himself in a moment of temporary enthusiasm on the Martian question; for we find a few pages later the following quotation from Herschel: "I determined to accept nothing on faith, but to see with my own eyes what others had seen before me." Or was this quotation given to discredit Herschel's work?— plainly he had the avowed purpose to "see" what he was "told by others was visible."

I shall mention an instance in which the author puts particular value in negative evidence. Professor Campbell's observations are taken as conclusive that water vapor does not exist on Mars. Why make no mention even of the fact that Mr. Very's measures of Dr. V. M. Slipher's spectrograms, without exception, show that water vapor is present? They were made with the best of instruments and under the most favorable conditions.

It is significant that the book contains no copy of any of the many beautiful drawings of Mars that show the canals. Was it not safe to gratify the natural curiosity of the reader, and allow him to see how so many have pictured those strange products of their imagination?

K. P. WILLIAMS.

NOTES.

THE annual meeting of the American Mathematical Society will be held in New York City on January 1–2, 1915. At this meeting President E. B. VAN VLECK will deliver his Presidential Address, on "The role of the point set theory in geometry and dynamics." The Chicago meeting of the Society will be held on December 28–29. Section A of the

American association for the advancement of science will hold its sessions on December 30–31, at Philadelphia.

A NEW edition of the List of Officers and Members of the American Mathematical Society is now in preparation, and will be issued in January. Blanks for furnishing information have been sent to members. A prompt response is requested, in order that the data may be correct and complete.

THE office of the American Mathematical Society, provided and partly furnished a year ago by Columbia University, was destroyed by fire on the early morning of October 10, with complete loss of files and records and a considerable stock of volumes of the BULLETIN and *Transactions*. Of the *Transactions* and the later volumes of the BULLETIN, the Society still has a sufficient supply. But the first ten volumes of the BULLETIN were completely destroyed. The Society will be glad to receive gifts of any of these early BULLETINS, and also copies of the Annual Register and Catalogue of the Library, which were also lost in the fire.

THE concluding (October) number of volume 15 of the *Transactions of the American Mathematical Society* contains the following papers: "The conic as a space element," by R. A. JOHNSON; "The Weierstrass E-function for problems of the calculus of variations in space," by G. A. BLISS; "The subgroups of the quaternary abelian linear group," by H. H. MITCHELL; "Transformations of conjugate systems with equal point invariants," by L. P. EISENHART; "Proof of the finiteness of the modular covariants of a system of binary forms and cogredient points," by F. B. WILEY; "On the degree of convergence of Sturm-Liouville series," by DUNHAM JACKSON; "Singular integral equations of the Volterra type," by C. E. LOVE; "On the reduction of integro-differential equations," by G. C. EVANS; "Invariants in the theory of numbers," by L. E. DICKSON. Also addenda and errata for volumes 11 and 14 by E. B. LYTLE and OSWALD VEBLEN, and general index of volumes 11–15.

THE concluding (October) number of volume 36 of the *American Journal of Mathematics* contains: "The quartic curve and its inscribed configurations," by H. BATEMAN; 'On the continuity of a Lebesgue integral with respect to a

parameter," by J. K. LAMOND; "Geometry on ruled surfaces," by S. LEFSCHETZ; "Restricted systems of equations (second paper)," by A. B. COBLE; "Character of the solutions of certain functional equations," by T. E. MASON; "Binary conditions for double and triple points on a cubic," by L. A. HOWLAND; "Modular invariants of two pairs of cogredient variables," by W. C. KRATHWOHL.

THE opening (September) number of volume 16 of the *Annals of Mathematics* contains: "Invariantive characterization of some linear associative algebras," by OLIVE C. HAZLETT; "On the theory of n-lines," by LENNIE P. COPELAND; "Plane curves with consecutive double points," by F. R. SHARPE and C. F. CRÀIG; "The effect of radiation on a small particle revolving about Jupiter," by T. H. BROWN; "Non-homogeneous linear equations in infinitely many unknowns," by ANNA J. PELL; "The inscribed and circumscribed squares of a quadrilateral and their significance in kinematic geometry," by C. M. HEBBERT; "A note on symmetric matrices," by G. A. BLISS.

AFTER ten years of successful experience, the Mathematical club of Syracuse University has been reorganized into a mathematical fraternity, Pi Mu Epsilon, whose aims are the advancement of mathematics and scholarship. The fraternity is incorporated under the laws of the State of New York, with power to grant charters to other chapters.

THE Association of mathematics teachers of New Jersey held its first meeting at Rutgers College on November 7. The programme included an address of welcome by President W. H. S. DEMAREST of Rutgers College and response by H. E. WEBB, and the following papers: "The place of mathematics in the high school curriculum," by G. H. ECKELS; "Number and the quadratic," by RICHARD MORRIS; "The mechanics of aviation," by L. P. EISENHART; "Advanced mathematics in the high school," by R. W. LORD; "High school mathematics," by T. G. VAN KIRK; "Fractional equations in algebra," by H. H. ALLEN; "Certain definitions in geometry," by H. E. WEBB. These were followed by the report of the committee on the constitution. The temporary officers of the society are RICHARD MORRIS, president; H. H. ALLEN,

secretary-treasurer; G. G. BROWER and H. E. WEBB, executive committee.

UNIVERSITY OF MUNICH.—The following mathematical courses are announced for the present semester: By Professor F. LINDEMANN: Theory of functions of a complex variable, four hours; Plane analytic geometry, four hours; Theory of higher algebraic curves, two hours; Seminar, two hours.—By Professor A. VOSS: Differential calculus, four hours; with exercises, two hours; Mechanics, four hours; Seminar in mechanics, two hours.—By Professor A. PRINGSHEIM: Algebra, four hours; Theory of numbers, four hours.—By Professor H. BRUNN: Elements of higher mathematics, four hours.—By Professor F. HARTOGS: Descriptive geometry, I, four hours; with exercises, three hours; Theory of determinants, two hours.—By Dr. F. BÖHM: Integral calculus, with exercises, five hours; Mathematical statistics, four hours; Mathematical literature, two hours.—By Dr. H. DINGLER: Elementary mathematics, four hours; Differential geometry of plane curves, two hours; Colloquium, two hours; Reduction of observational data, two hours.—By Dr. A. ROSENTHAL: Theory of functions of a real variable, three hours; Seminar, two hours.

THE Prince Jablonowski Society announces the following prize problem for 1916:

To extend the theory of linear functional differential equations in any direction. It is particularly desired to have an exhaustive treatment of some new special cases.

ON the occasion of the Australian meeting of the British Association, the University of Adelaide conferred the degree of doctor of science on Sir OLIVER LODGE, Professor T. W. EDGEWORTH, of Oxford, and Professor E. W. BROWN, of Yale.

DR. W. VOGT, of the technical school at Carlsruhe, has been appointed professor of mathematics at the University of Heidelberg.

PROFESSOR R. ROTHE, of the technical school at Hanover, has been called to the technical school at Charlottenburg, to succeed the late Professor HETTNER.

AT the University of Nebraska, Professor H. T. JOHNSON has resigned to enter business. Mr. O. GISH has been appointed instructor in mathematics.

PROFESSOR WILLIAM MARSHALL, on leave from Purdue University, has returned from Europe and has been appointed assistant professor of mathematics in the University of Arizona for the year 1914–1915.

AT the University of Pennsylvania, Dr. O. E. GLENN has been promoted to a full professorship of mathematics, and Dr. H. H. MITCHELL to an assistant professorship of mathematics. Dr. L. J. REED has been appointed instructor in mathematics.

AT Wellesley College, Dr. CLARA E. SMITH has been promoted to an associate professorship of mathematics.

DR. H. T. BURGESS, of the University of Wisconsin, has been promoted to an assistant professorship of mathematics.

AT the University of Nebraska, Dr. HENRY BLUMBERG has been promoted to an assistant professorship of mathematics.

PROFESSORS P. BOUTROUX and J. H. M. WEDDERBURN, of Princeton University, have returned to Europe and offered their services to their respective governments.

DR. C. SHAW has been appointed professor of mathematics in the University of Idaho.

DR. C. F. CRAIG, of Cornell University, who was granted leave of absence during the present academic year, has resumed his regular duties at the University.

MR. L. R. FORD, of Harvard University, has resigned, on account of the war, the Sheldon fellowship on which he was to have studied abroad, and has accepted a lectureship in mathematics at the University of Edinburgh.

MR. P. E. HENKE and Mr. L. E. WILLIAMS have been appointed instructors in mathematics at the Georgia School of Technology.

MR. W. A. REINERT has been appointed instructor in mathematics at the Michigan Agricultural College.

MR. H. D. FRARY has been appointed instructor in mathematics at the State University of Iowa.

MR. E. B. ESCOTT, of the University of Michigan, has resigned his position to enter on actuarial work.

BOOK catalogues: Galloway and Porter, Cambridge, England, catalogue 74, 412 titles.—Alexander Brunton, 54 Hanover Street, Edinburgh, catalogue of antiquarian and modern mathematical books.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

ALANDER (M.). Sur le déplacement des zéros des fonctions entières par leur dérivation. Upsala, 1914. 8vo. 63 pp. M. 2.50

BACHELIER (L.). Le jeu, la chance et le hasard. (Bibliothèque de Philosophie scientifique.) Paris, Flammarion, 1914. 8vo. 320 pp.
Fr. 3.50

BAYLISS (R. W.). A first school calculus. London, Arnold, 1914. Cr. 8vo. 4s. 6d.

BERNSTEIN (B. A.). Complete set of postulates for the logic of classes expressed in terms of the operation "exception", and a proof of the independence of a set of postulates due to Del Ré. Berkeley (*Univ. Calif. Publ.*), 1914. Royal 8vo. 10 pp.

BIOCHE (CH.). Histoire des mathématiques. Paris, E. Belin, 1914. 16mo. Fr. 1.75

BJÖRNBO (A.). See WERNER.

BOMPIANI (E.). Forma geometrica delle condizioni per la deformabilità delle ipersuperficie. Roma, tip. r. accademia dei Lincei (Estr. *Rendiconti d. r. accademia dei Lincei; scienze fisiche*), 1914. 8vo. 6 pp.

BRIDGES (J. H.). The life and work of Roger Bacon: an introduction to the Opus Majus. Edited with additional notes and tables by H. G. Jones. London, Williams and Norgate, 1914. 3s

CARMICHAEL (R. D.). The theory of numbers. (Mathematical Monographs, No. 13.) New York, Wiley, 1914. 8vo. 94 pp. Cloth. $1.00

CASTELNUOVO (G.). Lezioni di geometria analytica. 3a edizione. Milano, 1914. 8vo. L. 15.00

CHERUBINO (S.). Sulle curve iperellittiche con trasformazioni birazionali singolari in sè e sui loro moduli algebrici. Torino (*Atti della r. accademia delle scienze*), tip. V. Bona, 1914. 8vo. 22 pp.