

matrix invariants, the connection with dyadics and linear substitutions, the related triadics, polyadics, etc. This is a very extended field with numerous ramifications, and a complete treatise is in duty bound to consider these. On the side of determinants, which is the really major part of the treatise, one might insist on a consideration of the numerous special forms of determinants. The related matrices have interesting properties. Then finally the whole subject of groups of matrices leading to the field of linear associative algebra needs consideration, as well as the modern developments in the study of infinite matrices. There does not seem to be any indication that these are to be treated at all.

The treatment is quite detailed, with numerous numerical examples, rather loose in its development, and lacking in synthesis, so that the reader becomes bewildered with the multitudinous formulas and other details. A synopsis of it would be useful. There are some errors easily noticed

JAMES BYRNIE SHAW.

NOTES.

THE seventy-second meeting of the American association for the advancement of science was held at St. Louis, December 29 to January 3, under the presidency of Dr. SIMON FLEXNER. Professor O. D. KELLOGG was vice-president and Professor F. R. MOULTON secretary of Section A. The address of Professor G. D. BIRKHOFF, as retiring vice-president of Section A, on "Recent advances in dynamics," was delivered on December 30. This address was published in *Science* of January 16. Professor D. R. CURTISS was elected vice-president of Section A for the next two years. Among the societies meeting at St. Louis in affiliation with the Association were the Chicago and Southwestern Sections of the American Mathematical Society and the Missouri Section of the Mathematical Association of America.

THE fifth annual meeting of the Mathematical Association of America was held at Columbia University, New York City, on Thursday and Friday, January 1-2, immediately following the annual meeting of the American Mathematical Society.

The attendance included 107 members. The programme on Thursday included the following papers: "Mathematics for the physiologist and physician," by H. B. WILLIAMS; "The regular solids and the types of crystal symmetry," by P. L. SAUREL; "The mathematics of physical chemistry," by G. B. PEGRAM; "The mathematics of biometry," by L. J. REED, and "An experiment in conducting freshman mathematics courses," by F. B. WILEY; on Friday morning, a preliminary report of the National Committee on Mathematical Requirements, by J. W. YOUNG, and "Mathematics for students of physics," by LEIGH PAGE. At the business meeting on Friday, Professor D. E. SMITH was elected president, Professors HELEN A. MERRILL and E. J. WILCZYNSKI vice-presidents, and Professors R. D. CARMICHAEL, E. R. HEDRICK, H. E. SLAUGHT, and J. W. YOUNG members of the Council to serve until January, 1923. The Association held a joint dinner with the American Mathematical Society on Wednesday evening, December 31, at Students Hall, Barnard College.

According to its annual List of Members, issued November, 1919, the Mathematical Association of America then had a total membership of 1,187, including 87 institutional members. At the December meeting 75 new members were elected.

THE opening (January) number of volume 21 of the *Transactions of the American Mathematical Society* contains the following papers: "The strain of a gravitating sphere of variable density and elasticity," by L. M. HOSKINS; "The geometry of hermitian forms," by J. L. COOLIDGE; "Certain types of involutorial space transformations," by F. R. SHARPE and VIRGIL SNYDER.

THE concluding (October) number of volume 41 of the *American Journal of Mathematics* contains the following papers: "The ten nodes of the rational sextic and of the Cayley symmetroid," by A. B. COBLE; "Functions of matrices," by H. B. PHILLIPS; "On the Lüroth quartic curve," by FRANK MORLEY; "On the order of a restricted system of equations," by F. F. DECKER; "On the Lie-Riemann-Helmholtz-Hilbert problem of the foundations of geometry," by R. L. MOORE.

FIVE German publishers of scientific works, G. J. Göschen, J. Guttentag, G. Reimer, K. J. Trübner, and Veit, have united

in a single firm, the Vereinigung wissenschaftlicher Verleger, Walter de Gruyter und Compagnie, Berlin and Leipzig. The Berlin address is Genthinerstrasse 38, Berlin W. 10. This firm will continue the publication of the *Jahrbuch über die Fortschritte der Mathematik*.

PROFESSOR L. BERZOLARI, of the University of Pavia, and Colonel A. CROCCO, of the Aeronautic Institute of Rome, have been elected corresponding members of the R. Accademia dei Lincei.

PROFESSOR E. DANIELE, of the University of Catania, has been appointed professor of rational mechanics at the University of Modena.

SIR J. J. THOMSON has been elected foreign associate of the Paris Academy of Sciences, in place of the late Professor J. W. R. DEDEKIND.

MR. G. H. HARDY, fellow and mathematical lecturer of Trinity College, Cambridge, has been appointed to the Savilian professorship of geometry at Oxford University.

DR. J. PROUDMAN has been appointed professor of applied mathematics at the University of Liverpool.

PROFESSOR A. G. WEBSTER, of Clark University, has been elected honorary member of the Royal Institution of Great Britain.

PROFESSOR L. D. AMES has been made registrar and Mr. ELBERT ALLEN instructor in mathematics at the University of Missouri.

AT Teachers College, Columbia University, Professor C. B. UPTON, of the department of mathematics, and secretary of the college since 1911, has been appointed provost.

MR. R. M. BARTON has been promoted to an assistant professorship of mathematics at the University of Minnesota.

DR. H. E. WOLFE has been appointed assistant professor of mathematics at Indiana University.

PROFESSOR L. S. SHIVELY, of the department of mathematics at Mount Morris College, has been made president of the college.

MR. T. W. JACKSON has been appointed head of the department of mathematics at Jamestown College.

MR. F. C. KENT has been promoted to an assistant professorship of mathematics at the Oregon Agricultural College.

MR. W. H. SHERK has been appointed professor of mathematics at the University of Buffalo.

DR. T. MCN. SIMPSON has returned from Y. M. C. A. service in France and has been appointed professor of mathematics at Randolph-Macon College.

MR. L. H. RICE, of Tufts College, has been appointed instructor in mathematics at the Massachusetts Institute of Technology.

MR. H. L. OLSON has been appointed instructor in mathematics at the University of Wisconsin.

MR. NORMAN ANNING has been appointed instructor in mathematics at the University of Maine.

THE following instructors in mathematics have been appointed at Purdue University: G. D. JAMES, T. S. RAIFORD, and R. S. UNDERWOOD.

PROFESSOR V. REINA, of the University of Rome, died November 9, 1919, at the age of fifty-three years.

PROFESSOR E. MILLOSEWICH, of the observatory of the Collegio Romano, died December 5, 1919, at the age of seventy years. He was a national member and the secretary of the R. Accademia dei Lincei.

PROFESSOR A. HURWITZ, of the Polytechnicum of Zurich, died November 18, 1919, at the age of seventy years.

PROFESSOR L. G. WELD, director of the Pullman school of manual training, died November 28, 1919. Professor Weld had been a member of the American Mathematical Society since 1892.

PRESIDENT R. C. MACLAURIN, of the Massachusetts Institute of Technology, died January 15, 1920. Dr. Maclaurin had been a member of the American Mathematical Society since 1908.

BOOK CATALOGUES: Macmillan Company, catalogue of 138 books on mathematics and astronomy.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

- BOULIGAND (G.). Cours de géométrie analytique. Paris, Vuibert, 1919. 8vo. 421 pp. Fr. 10.00
- CLAPIER (F. C.). Sur les surfaces minima ou élassoïdes. (Thèse, Paris.) Paris, Gauthier-Villars, 1919. 4to. 63 pp. Fr. 3.00
- FIEDLER (W.). See SALMON (G.).
- GALEMBERT (—, DE). Nouvelles méthodes de résolution des équations du 3e degré. Paris, Vuibert, 1919. 8vo. 22 pp.
- KIEPERT (L.). Grundriss der Differential- und Integralrechnung. 1ter Band: Differentialrechnung. 13te Auflage. 1918. M. 20.00
- MONTESUS DE BALLORE (R. DE). Introduction à la théorie des courbes gauches algébriques. Paris, Croville-Morant, 1918. 4to. 112 pp.
- RUNGE (C.). Vektoranalysis. 1ter Band: Die Vektoranalysis des dreidimensionalen Raumes. Leipzig, Hirzel, 1919. 8 + 195 pp. Geb. M. 13.00
- SALMON (G.). Analytische Geometrie des Raumes. Deutsch von W. Fiedler. 2ter Teil: Kurven im Raum. 3te Auflage. 1916. M. 24.00
- SCHEFFERS (G.). Lehrbuch der Mathematik. Eine Einführung in die Differential- und Integralrechnung und in die analytische Geometrie. 3te Auflage. 1916. M. 29.90
- THOMAS (R. G.). Applied calculus. Principles and applications; essentials for students and engineers. New York, Van Nostrand, 1919. 12mo. 500 pp. \$3.00
- TURC (A.). Introduction élémentaire à la géométrie Lobatschewskienne. Ouvrage posthume. Genève, Kündig, 1919. 8vo. 170 pp. Fr. 3.50