

coordinates. Consequently, a book on coordinate systems, like the present one, necessarily lacks unity since a fundamental unifying principle, such as the group concept in the theory of transformations, has not yet been found.

E. J. WILCZYNSKI.

NOTES.

THE official list of officers and members of the American Mathematical Society will be published in January. Blanks for furnishing necessary information were sent out some time ago. To insure accuracy, members are requested to inform the Secretary at once of any changes of status or address.

THE following changes in the editorial staff of the *Transactions* will soon take place: Professor H. S. WHITE retires from the Editorial Board on February 1, and will be succeeded by Professor P. F. SMITH. Professor W. R. LONGLEY and Dr. R. L. MOORE have been appointed associate editors. Professor ARTHUR RANUM has consented to serve as associate editor until Professor HUTCHINSON is able to resume his work.

AT the annual meeting of the London mathematical society held on November 13, the following officers were elected for the present academic year: president, A. E. H. LOVE; vice-presidents, H. F. BAKER and W. BURNSIDE; secretaries, J. H. GRACE and T. J. BROMWICH. Also two members of the council. The following papers were presented at the meeting. By G. T. BENNETT, "The skew-isogram mechanism"; by G. H. HARDY and J. E. LITTLEWOOD, "Tauberian theorems concerning power series the coefficients of which are positive"; by G. H. HARDY, "Lambert's theorem"; by J. E. CAMPBELL, "The connection between surfaces the lines of curvature of which are spherical and surfaces the inflectional tangents of which belong to linear complexes," and "Surfaces the systems of inflectional tangents of which belong to systems of linear complexes"; by W. H. YOUNG, "Integration with respect to a function of bounded variation"; by W. W. JOHNSON, "The computation of Cotes's numbers, and their values up to $n = 20$ "; by S. G. SOAL, "Some ruler constructions for the covariants of a binary quantic"; by T. C. LEWIS, "Analogues of orthocentric tetrahedra in higher space."

THE third Scandinavian congress of mathematicians was held at Christiania September 3-6 under the presidency of Professor C. STÖRMER. The following papers were presented at the congress: N. NIELSEN, "Some applications of Bernoulli's numbers to the theory of numbers"; A. WIMAN, "The relation between the maximum modulus and the largest term of an analytic function"; G. STRÖMBERG, "Analysis of the temperature curve for Stockholm during the period 1894-1911"; G. MITTAG-LEFFLER, "A theorem of Abel and Dirichlet's series"; J. HJELMSLEV, "Geometry of reality"; K. F. SUNDMAN, "Apparatus for finding special perturbations"; J. F. STEFFENSEN, "Analytic representation of sums in the theory of numbers"; N. E. NÖRLUND, "Facultative series"; L. VEGARD, "Action of a gravitational field of force upon certain solutions"; P. HEEGAARD, "Contributions to the theory of graphs"; M. RIESZ, "On Fourier's series"; E. PHRAGMEN, "Remarks on the preceding congress"; W. V. JENSEN, "A formula in the theory of numbers," and "On the roots of algebraic equations"; C. JUEL, "Toroidal non-algebraic surfaces of the fourth order"; V. BJERKNES, "Mathematical treatment of meteorological problems"; J. HJELMSLEV, "Geometric experience"; M. T. SKOLEM, "Constitution of groups of the identical calculus"; A. PALMSTRÖM, "Calculation of invalid insurance"; S. JOHANSSON, "Representation of automorphic potentials"; HOLTSMARK, "The calculation of insurance on two lives."

THE Swiss mathematical society held its fourth annual meeting at Frauenfeld, September 9, under the presidency of Professor H. FEHR. The following papers were presented at the meeting. By L. CRELIER, "On correspondences in synthetic geometry"; by R. FUETER, "On algebraic equations with given groups"; by G. DUMAS, "On the singularities of surfaces"; by A. SPEISER, "On the factorization of algebraic forms"; by L. BIEBERBACH, "A new method of conformal representation"; by E. MARCHAND, "Newton's rule in the theory of algebraic equations"; by F. RUDIO, "Report on the publication of Euler's works"; by D. MIRMANOFF, "Some points in the theory of sets"; by W. H. YOUNG, "The integral of Stieltjes and its generalization"; by A. EINSTEIN, "Physical basis and directing ideas of a theory of gravitation"; by M. GROSSMANN, "Mathematical

definitions, methods, and problems connected with the theory of gravitation."

THE Société physico-mathématique of Kasan offers a Lobachevsky prize of 500 roubles for the most important work on non-euclidean geometry published during the six years prior to November 4, 1915.

IN Teubner's abbreviated catalogue, issued in October, 1913, appear, among others, the following announcements. The second part of volume one of the second German edition of Pascal's Repertorium der höheren Mathematik is to appear in the spring of 1914; the second part of the second volume is promised before New Year's. In the Grundlehren der Mathematik für Studierende und Lehrer two further volumes are being prepared: Algebra, by E. Netto, and Geometrische Gebilde vom Standpunkte der Verwandtschaften, by W. F. Meyer. The investigations of the Bolyai (W. and J.), by P. Stäckel, is in the press; Geheimnisse der Rechenkünstler by P. Maenchen will appear in December. Twenty-seven volumes on advanced mathematics are either in the press or in advanced preparation. Of the encyclopedia, eleven parts of the German edition and twenty-five of the French are in the press.

THE twenty-first meeting of the Association of teachers of mathematics in the middle states and Maryland was held at Albany, November 29, 1913, extending through a morning and afternoon session. The following papers were presented, "Are particular abilities necessary for the pupil to gain an understanding of the elementary and secondary mathematics as usually given at the present time?" by M. J. BABB and C. F. WHEELOCK; "A comparison at equal school ages of the attainments in mathematics of the European and American schoolboy with a consideration of causes and remedies," by J. C. BROWN; "Mathematics as a means to culture and discipline," by A. D. YOCUM; "The use of the question in the classroom," by R. STEVENS.

At the business meeting, Mr. E. R. SMITH, of the Park School, Baltimore, was elected president, Professor H. E. HAWKES of Columbia University, vice-president, and Mr. H. F. HART, of the Montclair high school, secretary.

The association comprises five sections, whose meeting places are at Philadelphia, Pittsburg, New York, Rochester, and Syracuse, respectively.

THE firm of Martin Schilling in Leipzig announces sixteen new models of curves of constant width (series XL, numbers 4 to 19) by Professor F. Schilling (price M 145); a plaster model of the surface of centers of the cubic asymptotic surface $xyz = a^3$ (series XLIII, number 8), by Professor E. Beutel (price M 120); five approximations curve from the theory of Fourier series (series L, numbers 1-5), by Mr. H. Küstner and Dr. L. Föppl (price, M 7.50).

THE announcement, in the November BULLETIN, of the mathematical courses given at the technical school of Stuttgart during the present semester should have included the following: Professor R. MEHMKE: Point analysis, with exercises, four hours.

THE royal society of Edinburgh has elected as honorary fellows Professors H. LAMB of the University of Manchester and V. VOLTERRA, of the University of Rome.

PROFESSOR F. KLEIN, of the University of Göttingen, has been elected to membership in the academies of Berlin, Bucharest, and Naples.

PROFESSOR D. HILBERT, of the University of Göttingen, has been elected corresponding member of the royal academy of sciences at Berlin.

PROFESSOR K. BOEHM, of the University of Heidelberg, has been appointed professor of mathematics at the University of Königsberg, as successor to Professor G. FABER, who has accepted a similar position at the University of Strassburg.

AT the University of Agram Professor G. MAJCEN has been promoted to a full professorship of mathematics.

DR. R. WEITZENBÖCK, of the University of Vienna, has been appointed docent in mathematics at the University and the Technical School of Gratz.

DR. K. BERLINER and DR. L. HENOCH have been appointed docents in mathematics at the University of Bern.

DR. A. PROELL, of the technical school at Danzig, has been appointed professor of mechanics at the German technical school at Brünn.

HON. BERTRAND RUSSELL, lecturer at Trinity College, Cambridge University, has been appointed lecturer in philosophy at Harvard University for the current year. Beginning early in March, he will give courses in the theory of knowledge and advanced logic.

AT the College of the City of New York Dr. F. G. REYNOLDS has been promoted from an assistant professorship to an associate professorship of mathematics. Dr. M. PHILIP has been promoted to an assistant professorship, and Mr. G. M. BRETT to an instructorship.

PROFESSOR J. F. DOWNEY, of the University of Minnesota, will retire at the end of the present academic year.

AT the University of Michigan assistant professors PETER FIELD and T. R. RUNNING have been promoted to junior professorships and Dr. C. E. LOVE to an assistant professorship of mathematics. Dr. TOMLINSON FORT, Mr. C. H. FORSYTHE, Mr. BARNEM LIBBY, and Mr. L. J. ROUSE have been appointed instructors in mathematics.

AT the University of Illinois Professor H. L. RIETZ has been promoted to a full professorship of mathematics; Mr. H. C. ZEIS has been appointed assistant in mathematics. Mr. G. E. CARSCALLEN has resigned to accept the professorship of mathematics at Hiram College.

MR. C. W. WESTER has been appointed instructor in mathematics at the University of Iowa.

MR. C. P. MILLS has been appointed instructor in mathematics in the Carnegie Institute of Technology.

MISS FLORENCE KENDALL and Mr. W. E. EDINGTON have been appointed instructors in mathematics at the University of Colorado.

PROFESSOR F. POCKELS, of the University of Heidelberg, died August 29, at the age of 60 years.

DR. H. VALENTINER, formerly of the University of Copenhagen, died September 17, at the age of 62 years.

SIR ROBERT STAWELL BALL, Lowndean professor of astronomy and geometry in Cambridge University and for the last twenty-one years director of the Cambridge observatory, died November 25, at the age of 73 years.

DR. FRANZ KOLÁČEK, professor of mathematical physics in the Bohemian University of Prague, died December 8, at the age of 62 years.

PROFESSOR JOHN EASTMAN CLARKE, of Boston University, died November 22, at the age of 63 years. Dr. Clarke had been a member of the American Mathematical Society since 1900.

DR. H. J. MESSENGER, actuary of the Travelers Insurance Company, died December 15, at the age of 58 years. Dr. Messenger had been a member of the American Mathematical Society since 1889.

CATALOGUES of second-hand mathematical books.—Gustav Fock, Schlossgasse 7-9, Leipzig, catalogue 448, about 4700 titles in mathematics.—W. Heffer and Sons, Cambridge, England, catalogue 104, about 3500 titles in mathematics and science.—Henry Sotheran & Co., 140 Strand, London, catalogue 741, about 1500 titles in mathematics and science.