(2) On page 332, above the middle of the page, the statement "x approaches c" obviously should read "x approaches the first root of y_1 greater than a."

(3) Possibly an explicit statement should be made that $V_i(x)$, $i = 1, 2$, does not vanish identically over any interval, as is shown by the conditions on α_1 and α_2, and that the point l of case I is chosen so that $V_2(l) \neq 0$.

(4) The wording of Theorem I as regards the conditions on K_1, K_2, G_1 and G_2 is careless and could be improved by omitting the word "absolutely" and making no statement as to the integrability of K_1 and K_2.

TOMLINSON FORT.

NOTES.

THE July number (volume 40, number 3) of the *American Journal of Mathematics* contains the following papers: "Interpolation properties of orthogonal sets of solutions of differential equations," by O. D. KELLOGG; "Directed integration," by H. B. PHILLIPS; "P-way determinants, with an application to transvectants," by L. H. RICE; "On a certain general class of functional equations," by W. H. WILSON; "Contributions to the study of oscillation properties of the solutions of linear differential equations of the second order," by R. G. D. RICHARDSON.

THE editors of the *Periodico di Matematica* and its *Supplemento* announce that, on account of the war, the publication of both periodicals will be temporarily discontinued.

AT the meeting of the Edinburgh Mathematical Society held June 14, the following papers were read: By Miss E. PAIRMAN, "Relations connected with generalized differentiation"; by E. T. WHITTAKER, "Some new expansions in series of polynomials."

THE late Professor GASTON DARBOUX left a large part of his library to the newly established reading room of the department of mathematical sciences of the University of Paris.

THE following advanced courses in mathematics are offered at the Italian universities during the academic year 1918–1919:

UNIVERSITY OF BOLOGNA.—By Professor P. BURGATTI: Celestial mechanics, three hours.—By Professor L. DONATI: Electrodynamics; electro-optics; relativity, three hours.—By Professor F. ENRIQUES: Foundations of mathematics: (1) geometry, infinitesimal analysis, mechanics and cosmology in ancient Greece; (2) modern critique of principles, three hours.—By Professor S. PINCHERLE: Volterra's and Fréchet's functional calculus; existence theorems for differential equations; integral equations, three hours.

UNIVERSITY OF CATANIA.—By Professor M. CIPOLLA: Fourier's series; Dirichlet's problem; spherical and cylindrical functions; functions of a complex variable; elliptic functions; applications, four hours.—By Professor E. DANIELE: Differential equations of mathematical physics with applications, four hours.—By Professor G. SCORZA: Geometry of hyperspaces and some of its applications, four hours.—By Professor C. SEVERINI: Calculus of variations, four and one half hours.

UNIVERSITY OF GENOA.—By Professor G. LORIA: Infinitesimal geometry of curves and surfaces, three hours.—By Professor O. TEDONE: Partial differential equations with two independent variables and their application to the resolution of physical problems, three hours. By Professor ————: Analysis (advanced course), three hours.

UNIVERSITY OF MESSINA.—By Professor M. BOTTASSO: Vector analysis; newtonian potential; theory of elasticity, three hours.—By Professor P. CALAPSO: Elliptic functions, three hours.—By Professor G. GIAMBELLI: Analytic geometry of hyperspaces; geometrical theory of algebraic elimination, three hours.

UNIVERSITY OF NAPLES.—By Professor F. AMODEO: History of mathematics (from early times to 1200 A.D.), three hours.—By Professor A. DEL RE: n-dimensional analysis of Grassmann with applications to differential geometry and mechanics, four and one half hours.—By Professor R. MARCOLONGO: Fourier's series; spherical, cylindrical and Lamé's functions; applications, three hours.—By Professor D. MON-

TESANO: Theory of birational transformations of space; involutory birational transformations, three hours.—By Professor E. PASCAL: Selected topics of mathematical analysis, three hours.—By Professor L. PINTO: Geometrical optics, three hours.

UNIVERSITY OF PADUA.—By Professor F. D'ARCAIS: Functions of a complex variable; integral equations, four hours.—By Professor P. GAZZANIGA: Theory of numbers, three hours.—By Professor T. LEVI-CIVITA: Electromagnetic field, four hours.—By Professor G. RICCI: Absolute differential calculus with applications, four hours.—By Professor F. SEVERI: Differential geometry, four hours.

UNIVERSITY OF PALERMO: By Professor G. BAGNERA: General analytic functions; entire functions; linear differential equations, three hours.—By Professor M. DE FRANCHIS: Geometry of algebraic surfaces, three hours.—By Professor M. GEBBIA: Mechanics of continuous systems; newtonian and logarithmic potential; hydrostatics and hydrodynamics, four and one half hours.—By Professor A. SIGNORINI: Selected chapters of rational mechanics with particular regard to the theory of elasticity, three hours.

UNIVERSITY OF PAVIA.—By Professor L. BERZOLARI: Algebraic curves and surfaces, three hours.—By Professor U. CISOTTI: Hydrodynamics, three hours.—By Professor F. GERBALDI: Functions of a complex variable and elliptic functions, three hours.—By Professor G. VIVANTI: Theory of functions of real variables, three hours.

UNIVERSITY OF PISA.—By Professor E. BERTINI: Geometry on an algebraic curve, three hours.—By Professor L. BIANCHI: Theory of the continuous groups of transformations, four and one half hours.—By Professor U. DINI: Fourier's series and more general developments concerning the analytic representation of functions of a real variable in a given interval, four and one half hours.—By Professor G. A. MAGGI: Steady and variable electromagnetic fields, four and one half hours.—By Professor ————: Theoretical mechanics (advanced course), three hours.

UNIVERSITY OF ROME.—By Professor G. BISCONCINI: Geometrical applications of calculus, three hours.—By Professor

E. BOMPIANI: Contact transformations of space and their continuous groups, three hours.—By Professor G. CASTELNUOVO: Algebraic equations and groups of substitutions, three hours.—By Professor U. CRUDELI: Theory of continuous groups of transformations, three hours.—By Professor L. SILLA: Differential equations of dynamics, three hours.—By Professor V. VOLTERRA: General wave theory, three hours; Hydrodynamics, three hours.

UNIVERSITY OF TURIN.—By Professor T. BOGGIO: Equilibrium forms of a rotating fluid mass, three hours.—By Professor G. FUBINI: Modular, automorphic, fuchsian functions; linear differential equations with rational coefficients, three hours.—By Professor C. SEGRE: Algebraic complexes of straight lines, three hours.—By Professor C. SOMIGLIANA: Thermodynamics; theory of gases; propagation of heat, three hours.

PROFESSORS G. COLONNETTI, of the University of Pisa, E. LAURA, of the University of Pavia, and R. MARCOLONGO, of the University of Naples, has been elected corresponding members of the Reale Istituto Lombardo.

PROFESSOR P. HEEGAARD, of the University of Copenhagen, has been made professor of mathematics at the University of Christiania.

DR. T. BONNESEN has been appointed professor of descriptive geometry at the Copenhagen polytechnic school.

PROFESSOR E. HECKE, of the University of Basel, has been made professor of mathematics at the University of Göttingen.

PROFESSOR H. WEYL, of the polytechnic school of Zurich, has been made professor of mathematics at the University of Breslau.

SIR JOSEPH LARMOR has been awarded the Poncelet prize for the mathematical sciences this year by the Paris Academy of Sciences.

PROFESSOR HORACE LAMB, of the University of Manchester, has been appointed Halley lecturer at Oxford University for the coming year.

AT Clark University Professor A. G. WEBSTER has organized his department of physics for 1918–1919 into a ballistic institute, in which it is proposed to carry on research upon a considerable variety of subjects experimental as well as theoretical.

THE United States Bureau of Education has recently issued a Union List of Mathematical Periodicals prepared by Professor DAVID EUGENE SMITH and Dr. CAROLINE EUSTIS SEELY. This list contains the leading mathematical periodicals needed by research students and to be found in a number of the larger libraries in various parts of the country. Copies may be secured by addressing the United States Commissioner of Education, Washington, D. C.

THE following university and college teachers of mathematics have recently joined the national military service:

Professor ARNOLD DRESDEN, of the University of Wisconsin, Secretary of the Chicago Section of the Society, has gone to France in the service of the Red Cross. Professor W. C. GRAUSTEIN, of Rice Institute, has joined the ordnance at the Aberdeen proving ground. Dr. T. R. HOLLCROFT, of Columbia University, has entered the field artillery officers' training camp at Camp Zachary Taylor, Ky. Professor E. V. HUNTINGTON, of Harvard University, president of the Mathematical Association of America, has been given leave of absence and with the rank of major in the national army is assigned to statistical work under the chief of staff with residence at Washington. Professor P. R. RIDER, of Washington University, has entered the coast artillery training camp at Fort Monroe. Professor J. E. ROWE, of Pennsylvania State College, is engaged in mathematical research for the national advisory committee for aeronautics at Washington. Dr. NORBERT WIENER has joined the ordnance at the Aberdeen proving ground.

PROFESSOR G. A. MILLER, of the University of Illinois, has accepted the chairmanship of a committee which is to make a survey of the mathematical instruction given under the auspices of the Y. M. C. A. at the various naval stations.

PROFESSOR E. D. ROE, JR., of Syracuse University, has been given leave of absence for a year to devote his entire time to research.

AT the University of Illinois, the following promotions are announced: associate professor J. B. SHAW to a full professorship, assistant professor R. D. CARMICHAEL to an associate professorship, associates A. J. KEMPNER and G. E. WAHLIN to assistant professorships, instructor E. W. CHITTENDEN to associate, assistant R. F. BORDEN to an instructorship. Associate professor A. B. COBLE, of Johns Hopkins University, has been appointed professor of mathematics. Associate professor HENRY BLUMBERG, of the University of Nebraska, has been appointed associate and Mr. J. B. ROSENBACH, of the University of New Mexico, assistant. Assistant professor C. H. SISAM and Professor H. L. RIETZ have both resigned, Professor SISAM to become head of the department of mathematics at Colorado College and Professor RIETZ to become head of the department at the State University of Iowa.

DR. M. G. GABA, of Cornell University, has been appointed associate professor of mathematics at the University of Nebraska.

ASSISTANT professor W. V. LOVITT, of Purdue University, has been appointed associate professor of mathematics at Colorado College.

DR. FLORA E. LE STOURGEON, of the Liggett School, Detroit, has accepted an instructorship in mathematics at Mount Holyoke College.

DR. I. A. BARNETT has been appointed instructor in mathematics at Washington University.

ASSISTANT professor E. S. SMITH, of the University of Cincinnati, has been appointed acting commandant in addition to his duties in the department of mathematics.

PROFESSOR F. S. NOWLAN, of Brandon College, Brandon, Manitoba, has been appointed instructor in mathematics at Bowdoin College.

MR. J. W. LASLEY, JR., of the University of North Carolina, has been promoted to an assistant professorship of mathematics and given leave of absence for a year to study at the University of Chicago.

PROFESSOR G. CANTOR, of the University of Halle, died January 6, 1918, at the age of 73 years.

PROFESSOR M. SIMON, of the University of Strassburg, died in January, 1918, in his seventy-fourth year.

THE death is announced of Professor E. R. NEOVIUS, of the University of Helsingfors, at the age of 67 years.

THE death is announced of ALBERT GAUTHIER-VILLARS, head of the great publishing house of Paris.

PROFESSOR MAXIME BÔCHER, of Harvard University, died September 12, 1918, at the age of 51 years. Professor Bôcher had been a member of the American Mathematical Society since 1892, and was its president in 1909–1910.

THE Rev. Dr. G. M. SEARLE, superior general of the Paulist Fathers from 1904 to 1909, and previously professor of mathematics and director of the astronomical observatory of the Catholic University at Washington, died on July 8, 1918, at the age of 79 years. Dr. SEARLE had been a member of the American Mathematical Society since 1889.

PROFESSOR A. L. DANIELS, of the University of Vermont, died July 18, 1918, at the age of 69 years. Professor Daniels was made professor emeritus in 1914 after 29 years of service.